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Subsaharan Ceratopogonidae (Diptera) XII. New species and records, mainly from South Africa

by

BOTHA DE MEILLON

Co-operating Scientist, Systematic Entomology Laboratory, IIBIII, Agric. Res. Serv., United States Department of Agriculture, U.S.A. and Medical Entomology, Department of Tropical Pathology, School of Pathology, South African Institute for Medical Research and the University of the Witwatersrand, Johannesburg, 2000

and

WILLIS W. WIRTH

Co-operating Scientist, Systematic Entomology Laboratory, IIBIII, Agric. Res. Serv., United States Department of Agriculture, U.S.A.

Several recent collections of South African Ceratopogonidae have yielded records of 37 species, exclusive of *Culicoides*, of which 21 species in 14 genera are described as new: *Forcipomyia elegans, Dasyhelea soutini, D. upsilon, Alluaudomyia cobra, Bothahelea nama, Fanthamia abditus, F. jonkeri, Kolenohelea equilis, K. leonina, K. pedi, K. pugilator, Monohelea maureenae, Stilobezzia flavida, S. trimaculata, Mallochohelea hamata, M. unca, Sphaeromias eugenei, Bezzia haroldi, Palpomyia gilva, P. kurwana* and *P. verna.* The widespread Palaearctic and Oriental species *Bezzia albicornis* (Meigen) is redescribed and reported from South Africa for the first time and its synonymy is listed, including three new junior synonyms: *Bezzia strobli* Kieffer, *B. brevinervis* Kieffer, and *Homobezzia atrata* Macfie. Descriptions of hitherto unknown sexes are presented for six species, and keys are presented for identification of species in the genera *Dasyhelea, Palpomyia* and *Sphaeromias.*

INTRODUCTION

In the present study we report on collections made by the senior author in South Africa, in the Transvaal in 1980 and 1983 and Cape Province in 1980. Numerous collections have been made by various colleagues in Cape Province, Natal, and Transvaal, as listed in the acknowledgements. As noted previously the results of the current studies further indicate how incompletely the ceratopogonid fauna of southern Africa has been sampled. In the present study we record 37 species, exclusive of *Culicoides*, of which 21 species in 14 genera are described as new.

Correspondence: 8127 Cedar Road, Elkins Park, PHILADELPHIA Pa 19117 U.S.A.

METHODS

Nearly all our material was collected in water with a few drops of detergent, then, after gentle washing, placed in 80% alcohol. When using the Cross Emergent Trap insects were collected directly into 80% alcohol which meant that the trap could be left for days on end without attention. From alcohol, specimens were either mounted in phenol balsam according to the method of Wirth & Marston (1968) or, after removal of wings to be mounted dry, passed through the usual 10% potash-glacial acetic acid-phenol alcohol-phenol balsam.

The systematic arrangement used here follows that given in the Afrotropical Catalogue by Wirth *et al.* (1980). Keys to genera may be found in Wirth *et al.* (1974, 1977). Explanation of the taxonomic characters used can be found in the general papers on Ceratopogonidae by Wirth (1952), Wirth *et al.* (1977), Downes & Wirth (1981) and De Meillon & Wirth (1981*b*).

The holotypes of our new species, unless otherwise stated, are deposited in the South African Institute for Medical Research, Johannesburg (SAIMR). Paratypes whenever available are deposited in the British Museum (Natural History), London (BMNH), the Natal Museum, Pietermaritzburg (NM) and the National Museum of Natural History, Washington, DC, USA (USNM).

Subfamily FORCIPOMYIINAE

Genus *FORCIPOMYIA* Meigen

Forcipomyia castanea (Walker), Figs 1–5

New Record. SOUTH AFRICA: Cape Province, Heuningdraai, Kuruman Dist., ix.1983, G. & S. van Eeden, in UVL trap, 3♂, (NM; USNM).

Distribution. West Africa, South Africa, Malaysia?

This is the first record of the species from southern Africa. Its presence in the arid Karoo region of the country is unexpected. Fortunately the species is readily recognizable. Diagnostic characters of the males are illustrated in Figs 1–5.

Forcipomyia (Forcipomyia) elegans sp. nov., Figs 6–10

A strikingly ornamented species with pale median dorsal abdominal stripe and with clearly banded hind femur and tibia; without broad scales.

MALE. Wing length 1,21 mm.

Head. Dark brown; eyes narrowly separated. Antenna with segments 4–6 subglobular, thereafter gradually narrowing and lengthening, 11 being flask-shaped and nearly 3 × as long as at its widest; 11–15 with relative lengths 5–13–10–6–9; 15 with well-developed nipple-like apex. Palpus 5-segmented, 2–5 with relative lengths 15–35–12–12; segment 3 swollen medially where it bears a well marked but shallow sensory pit.

Thorax. Uniformly dark brown, contrasting sharply with abdomen; scutellum with 6 strong bristles. Wing unadorned, but with dense, stout black macrotrichia, or extremely narrow black scales, on costa; an ill-defined radial cell near end of costa. Legs: Hind femur (Fig. 6) with distal half darkened, tibia with subbasal dark band, another dark band past midlength, leaving apical third or less pale; basitarsus entirely dark. Mid femur resembling hind femur but less distinctly marked, rest of leg brown. Fore leg brown, tibia with faint broad subbasal and subapical pale bands. Tarsal ratios of hind, mid, and fore legs 0,86, 0,86 and 1,2. Fore tibia apically with short comb of fine pale teeth and hyaline apical spur about as long as width of tibia; hind tibia with long comb of stronger teeth, a row of 8 short apical bristles, and a strong apical spur about as long as width of tibia; claws small, equal, simple, and only slightly curved.

Abdomen. Brown with broad pale median stripe to near genitalia, similar stripes laterally and ventrally less well defined; segment 8 wholly pale. Ninth sternum (Fig. 10), especially at apical corners, and basal half of 9th tergum brownish, rest of tergum pale; distal half of basistyle brownish, rest pale; dististyle (Fig. 9) parallel-sided, with beak-like apex; parameres with 2 narrow long pointed unpigmented processes united basally in a wide arch (when pressure was applied the 2 parameres separated apically as shown in Fig. 8); aedeagus mostly pale with base, a median longitudinal band and 2 narrow lateral lines brownish, as figured (Fig. 7).

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: Transvaal, Arabie, Olifants River (24° 47′ S, 29° 30′ E) 20.ix.1982, H. Cross, UVL trap (SAIMR).

Subfamily DASYHELEINAE

Genus *DASYHELEA* Kieffer

Dasyhelea alboscutellata Clastrier, Figs 11–14

This species was described from a male reared from a pupa taken in a small stream at Le Grand Chaloup in Réunion and it has not been recorded since. The males in the present collection agree with Clastrier's description in all essential details. The hitherto unknown female is here described.

FEMALE. Very dark brown with pale-banded legs. Wing length 1,16 mm.

Head. Uniformly dark brown. Eyes narrowly separated by width of less than 1 facet; with minute interfacetal hairs. Antenna dark brown throughout; segments 4 & 5 subglobular, 6–14 increasingly vasiform but not changing much, 8 only slightly longer than broad, 15 elongate, a little more than 3 × as long as wide including pronounced nipple-like tip; antennal ratio (11–15/3–10) 0,8. Palpus pale, segments 3–5 with lengths in proportions of 5–3–4; 3 more or less parallel-sided, without sensory pit.

Thorax. Uniformly dark brown, scutellum paler. Wing unmarked, with radial veins and costa slightly darker; both radial cells closed, each represented by a slit; macrotrichia sparse; costal ratio 0,55. Legs (Fig. 11) white with prominent dark bands near middle of femora and tibiae of all legs, especially prominent on fore leg; in addition apices of femora and bases and apices of tibiae narrowly darkened; 5th tarsomeres on all legs slightly darker than other tarsomeres; hind tibiae apically with transverse comb of about 20 short dark teeth followed by a row of about 7 long colourless bristles, apical spur short and spine-like.

Abdomen. Dark brown like rest of body; distal sterna poorly sclerotized; 9th sternum with poorly defined median tongue-like projection under S8 (Fig. 13) projection clearly seen in side view (Fig. 14). Spermatheca (Fig. 12) single, very dark in colour with minute hyaline perforations.

New Records. SOUTH AFRICA: Transvaal, Gazankulu, Soutini, 18.x.1980,

H. Cross, UVL trap, 1 ♂ 1 ♀, Arabie, Olifants River, 20.i.1982, H. Cross, UVL trap, 3 ♂ 3 ♀ (BMNH, NM, SAIMR, USNM).

These specimens resemble *D. fontana* De Meillon & Wirth and *D. picata* Macfie in outward appearance; the male of *D. alboscutellata*, however, is easily distinguished by the narrow, straight, fused parameres and larger apicolateral processes of the 9th tergum. The female of *D. picata* has not been described but we have a specimen collected at the Augrabies Falls, Cape Province, associated with typical males. These three closely related species can be separated as follows:

1 Radial cells closed or very narrow 2
— Second radial cell open; (♀ spermatheca pyriform; ♂ parameres broader in midportion and bent apically) .... *picata* Macfie
2 ♀ spermatheca retort-shaped; ♂ parameres broader in midportion and bent apically .... *fontana* De Meillon & Wirth
— ♀ spermatheca pyriform; ♂ parameres parallel-sided and straight ..... *alboscutellata* Clastrier

Dasyhelea leporis De Meillon & Wirth

New Record. SOUTH AFRICA: Cape Province, Knysna, Diepwalle, 12–30.xii.81, S. & J. Peck, Malaise trap in forest, 3 ♂ (SAIMR, USNM).

Originally described from New Agatha, Transvaal, and recorded from Pietermaritzburg, Natal (coll. R. M. Miller).

It has not been possible to identify the female with certainty. The present collection from Knysna yielded 2 females, but they resemble those of *D. nigricans* Carter, Ingram & Macfie too closely to be assigned to *D. leporis*.

Dasyhelea soutini sp. nov., Figs 15–16

A small dark species without notable features. Its main distinction lies in the structure of the 9th sternum.

MALE. Wing length 0,73 mm.

Head. Eyes separated by slightly less than width of 2 facets; hairy. Antenna with relative lengths of segments 11–15, 11–20–23–23–23; antennal ratio (12–15/3–11) 0,86. Palpus pale and except for segment 3 not well developed; segment 3 longer than 4+5 combined, slightly enlarged, and without sensory pit.

Thorax. Uniformly dark brown except scutellum which is clear yellow with 4 strong bristles mesad and a lateral bristle on each side. Costal ratio 0,42; 2nd radial cell small and square-ended; macrotrichia dense and evenly distributed at wing tip, otherwise sparse and aligned; microtrichia not visible under 400 × magnification; alula bare. Halter infuscated. Legs pale brown without distinguishing features.

Abdomen. Dark brown. Genitalia (Figs 15–16) of usual type but with very long median tongue-like process from 9th sternum; fused paramere (normally present as a strong, sclerotized, median process) a faint largely transparent sclerite of indeterminate structure, barely visible and not shown in figure.

D. inconspicuosa Carter, Ingram & Macfie has a similar but smaller process of the 9th sternum and also differs in the shape of the dististyle which in *D. soutini* is short and stout and not so finely drawn out.

Material examined. Holotype ♂, paratype ♂: SOUTH AFRICA: Transvaal, Gazankulu, Soutini, 18.x.1980, H. Cross, UVL trap (holotype in SAIMR, paratype in USNM).

Dasyhelea upsilon sp. nov., Figs 17–22

A dark brown to blackish species without any distinctive markings, generally resembling members of the *grisea* group of species but basistyle without internal hook or protuberance.

Male: Wing length 1,4 mm.

Head. Eyes closely approximated, hairy. Palpus (Fig. 17) 5-segmented, pale; 3rd segment somewhat bottle-shaped and without sensory pit. Antenna with segment 4 about 2 × as wide as long, area below ring of verticils deeply striated longitudinally; 5–11 becoming progressively longer, 11 about 1,5 × as long as wide; relative lengths of 12–15 are 27–20–15–21; 15 with pronounced nipple-like apex.

Thorax. Mesonotum after maceration in potash with a pair of admedian, longitudinal pale stripes provided with setae, other setae scattered over surface; scutellum yellowish with a row of 12 bristles; postnotum darker; pleuron paler, bare. Wing typical; 1st radial cell undeveloped, 2nd open, longer than wide; costal ratio 0,49; macrotrichia sparse. Legs: fore tibia with apical transparent comb of fine teeth and some rather strong scattered setae; hind tibia subapically with transverse comb of about 16 short, dark, stout teeth, and apical row of 3 long and 4 shorter bristles; tibiae without apical spur.

Abdomen. Generally dark brown throughout. Ninth sternum slightly convex distally, tergum with well-developed apicolateral processes (Figs 21–22); basistyle with smooth internal margin and about 2 × as long as broad; dististyle (Fig. 18) slightly swollen basally, nearly straight and obliquely truncated apically; aedeagus (Fig. 19) unique, more or less V-shaped with borders and basal arms strongly sclerotized; parameres (Fig. 20) typical for this group of species.

Material examined. Holotype ♂: SOUTH AFRICA: N.E. Transvaal, Silver Leaves, New Agatha, Tzaneen, viii.1983, Klapwyk & De Meillon, 'Cross' trap (SAIMR).

Taken in a Cross emergence trap over a small rock pool measuring about 1 × 1,5 m and 8 cm deep, altitude about 1200 m ASL.

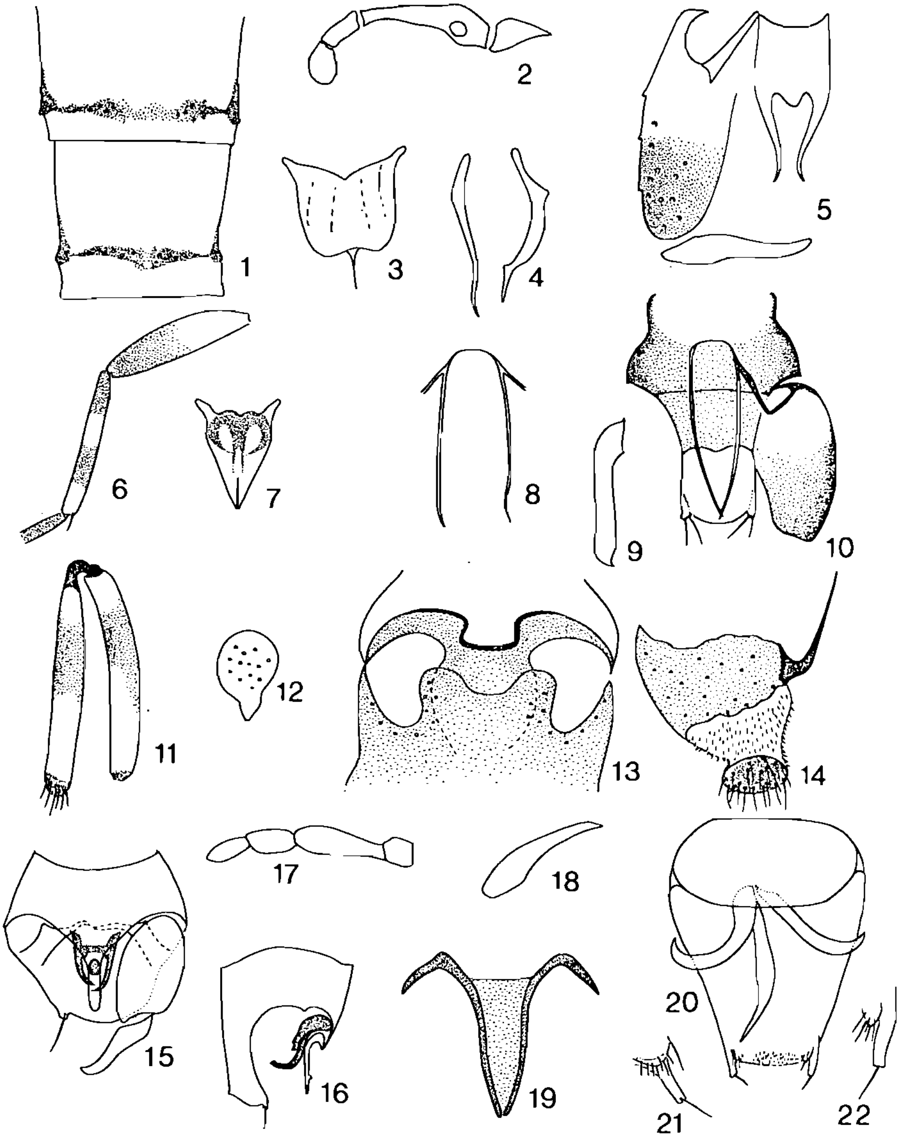
Subfamily CERATOPOGONINAE

Tribe CERATOPOGONINI

Genus *ALLUAUDOMYIA* Kieffer

Alluaudomyia natalensis De Meillon, Figs 23–26

The original description, based on a reared female (probably teneral), does not stress the sharp division in colour between the black lower half of the pleuron and abdomen and the pale yellow upper half which extends onto the mesonotum laterally. The mesonotum was described as 'creamy throughout' whereas in the present specimen it is light brown. The holotype, when remounted, agreed in all other respects with the female associated with the males described below.



Figs 1–5, *Forcipomyia castanea* ♂; 6–10, *F. elegans* ♂; 11–14, *Dasyhelea alboscutellata* ♀; 15–16, *D. soutini* ♂; 17–22, *D. upsilon* ♂; 1, abdominal terga 1–2; 2, 17, palpus; 3, 7, 19, aedeagus; 4, aedeagus and parameres, side view; 5, aedeagus, basistyle and dististyle; 6, 11, hind femur and tibia; 8, parameres; 9, 18, dististyle; 10, 9th segment, basistyle and parameres; 12, spermatheca; 13, genital sclerotization; 14, side view of same; 15, genitalia, ventral view; 16, same, side view; 20, 9th segment and parameres; 21, apicolateral process in dorsal view; 22, same in side view.

MALE. A small species with dark spots on the mesonotum, definitely spotted wings, banded legs, and distinctive genitalia. Figures in brackets are ranges from 3–4 slide-mounted specimens where appropriate. Wing length 0,95 (0,95–1,07) mm.

Head. Dark brown. Eyes closely approximated, bare. Antenna with torus dark brown, segment 3 paler, 4–12 white and not clearly separated from one another, 13–15 dark; relative lengths of 11–15 are 7–7–17–16–16; 15 with apical bristle subterminal. Palpus 5-segmented, pale; segments 2–5 approximately subequal; 3 parallel-sided, without sensory pit.

Thorax. Dark brown; mesonotum with darker spots at bases of setae, separated from dark brown pleuron by a broad pale yellow band extending from humeral callus to scutellum laterally. Scutellum dark brown in middle, bearing 4 strong bristles mesad and none laterally; postnotum dark brown. Wing (Fig. 23) white with faint brownish infuscation along veins, area below costa infuscated towards base of wing; 8–9 black spots as figured, the smaller of these somewhat variable in size; apex of wing above vein M1 without dark spot; radial cell small and narrow; macrotrichia not dense, confined to wing tip; alula bare; costal ratio 0,49. Legs banded, femora and tibiae narrowly pale basally (sub-basally on fore- and mid-tibiae) and with a subapical pale band, less pronounced on hind femur; hind basitarsus darkened, on other legs pale, other tarsomeres uniformly pale; 4th tarsomere cordiform; all claws small, equal and simple.

Abdomen. Mainly yellow in colour, but darker laterally, and poorly sclerotized towards apex. Genitalia (Figs 24–26) with 9th segment, especially tergum, unsclerotized and transparent, sternum with shallow but wide caudomedian excavation; basistyle slightly more than 2 × as long as wide, sclerotized to some degree; diststyle slightly sinuous, slender, colourless and blunt-ended (Fig. 26); aedeagus (Fig. 24) triangular on a wide base, on dorsal side of midportion a small blackish sclerite (such as described by De Meillon & Wirth (1983) in *A. lunata*); parameres (Fig. 25) separate, each consisting of a narrow, parallel-sided process carrying at its apex a flat, transparent, pyriform structure (the exact shape not evident until after dissection, staining and viewing from various angles; in conventional mount of genitalia this transparent structure hardly if at all visible).

New Records. SOUTH AFRICA: Transvaal, Motali River, (24° 25′ S, 31° 2′ E) 20.ix.1983, H. Cross 4 ♂; Cobra Mine, (23° 58′ S, 30° 37′ E), 30.ix.1983, H. Cross 3 ♂ 1 ♀ (BMNH, NM, SAIMR, USNM).

The wing markings and presence of a black central sclerite in the male genitalia place *A. natalensis* near *A. lunata* and *A. claudia* De Meillon. From both of these it is immediately distinguished by the shape of the translucent structure at the tip of the parameres.

Alluaudomyia cobra sp. nov., Figs 27–28

A species in which each dark wing spot is surrounded by a white halo as described for *A. wansoni* De Meillon. This character is poorly visible in specimens mounted in balsam.

FEMALE. Wing length 1,10 mm.

Resembling *A. wansoni* in all respects except for the structure of the genital sclerotization and spermatheca. In this species, and also as originally described in the holotype of *A. wansoni*, the abdomen and spermatheca were collapsed and the precise size and shape of the latter could not be determined. On the slides of each holotype the abdomen was removed, relaxed in caustic potash, and cleared in phenol-alcohol. The genital sclerotization of *A. wansoni* is shown in Fig. 29 and the spermatheca in Fig. 30, the latter measuring 0,104 × 0,084 mm. The spermatheca of *A. cobra* (Fig. 28, drawn to the same scale as Fig. 30) is much smaller, and the genital sclerotization and margin of sternum 8 (Fig. 27) differ markedly from those of *A. wansoni*.

MATERIAL EXAMINED. Holotype ♀: SOUTH AFRICA: Transvaal, Motali River, 14.ix.1982, H. Cross, UVL trap (SAIMR).

Alluaudomyia marmorata (Carter, Ingram & Macfie).

New Record. SOUTH AFRICA: Transvaal, Gazankulu, Soutini, 18.x.1980, De Meillon & Cross, UVL trap, 1 ♀ (USNM).

Distribution. Gambia, Senegal, Ghana, Sudan, Zaire, South Africa.

The species has a wide distribution north of the Equator and this is the first record so far south. In 1983 the authors described from this same light trap collection a second species, *A. soutini*, which resembles *A. marmorata* to some extent; however, the equal claws on all legs and the greatly lengthened diverticula of the spermathecae of the present specimen are typical of *A. marmorata*, and differ greatly from those of *A. soutini*.

Genus *BOTHAHELEA* Grogan & Wirth

Bothahelea nama sp. nov., Figs 46–49

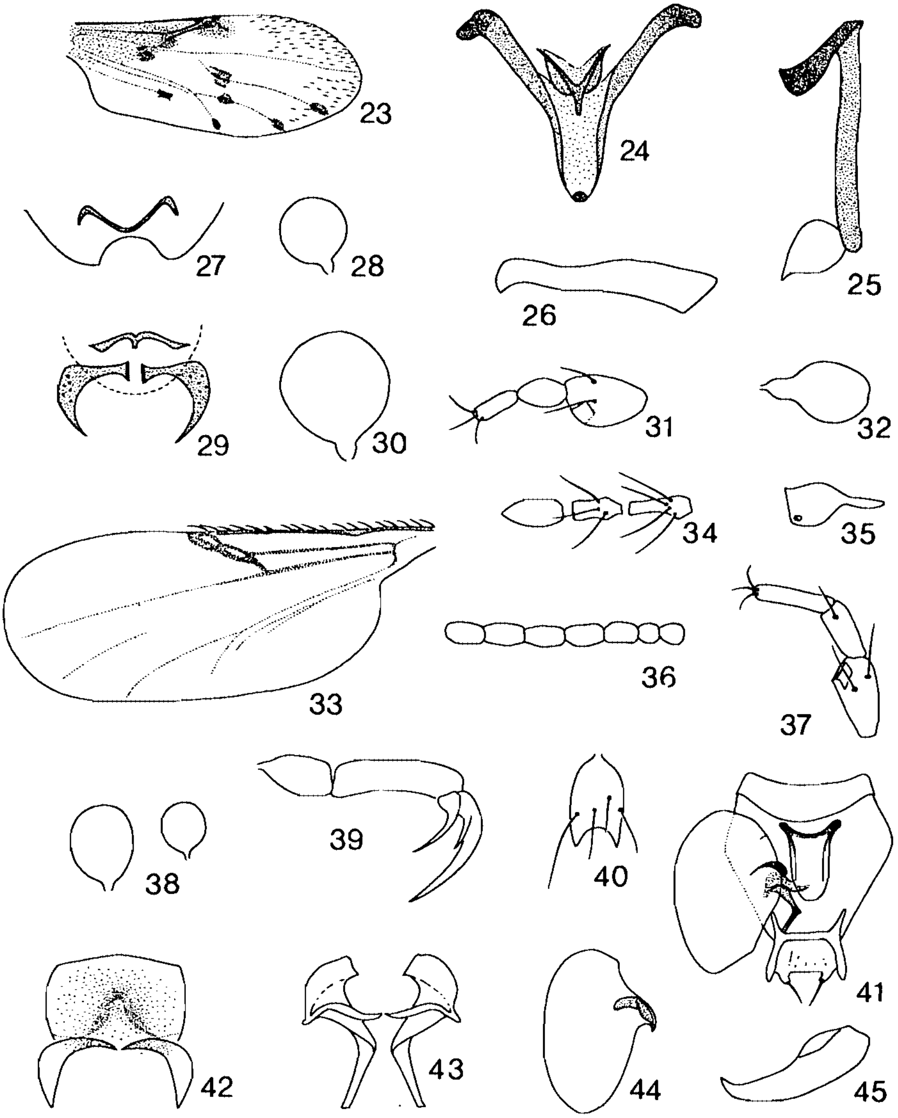
A completely blackish species, wing unornamented, and with genitalia greatly enlarged and reminiscent of *Kolenohelea*.

MALE. Wing length 1,32 mm.

Head. Blackish, antenna and palpus paler. Eyes widely separated, by width of about 5 facets; minutely pubescent. Antenna with 3rd segment bearing distally 1 small sensilla basiconica; segment 4 slightly longer than broad; 5–12 not fused, gradually narrowing, 12 being 1,6 × as long as wide, vasiform; relative lengths of 10–15 are 7–7–8–20–16–18; 15 with terminal seta. Palpus 5-segmented; 3rd segment slightly widening to apex where it bears a small but deep sensory pit; 3 slightly shorter than 4+5.

Thorax. The whole, including pleuron, postnotum and scutellum, black or very dark brown, with small hair-like setae and no large, strong bristles. Wing unadorned; 2 radial cells, 1st open but narrow and slit-like, 2nd not much longer than 1st but wider; costal ratio 0,58; macrotrichia and microtrichia absent; alula bare. Legs uniformly dark, unarmed, short black bristles or spines completely absent; no segments thickened or enlarged; fore tibia apically with slanted comb of thin transparent teeth and an apical sharp short spike-like spur; hind tibia with subapical comb of about 20 stronger teeth and apical row of 8–9 strong, subequal bristles, apical spur short, split; hind basitarsus with complete row of palisade setae and a small colourless apical spine; 4th tarsomeres cylindrical, slightly more than 2 × as long as wide, without whip-like sensory hairs as seen in *Kolenohelea*; claws small and equal.

Abdomen. Slightly paler than thorax. Genitalia (Figs 46–49) enlarged, main-



Figs 23–26, *Alluaudomyia natalensis* ♂; 27–28, *A. cobra* ♀; 29–30, *A. wansoni* ♀; 31–32, *Brachypogon corius* ♀; 33–45, *B. africanus* 23, 33, wing; 24, aedeagus; 25, single paramere; 26, 45, dististyle; 27, 29, 42, genital sclerotization; 28, 30, 32, 38, spermathecae; 31, 37, palpus; 34, male antennal segments 13–15; 35, male 3rd antennal segment; 36, female antennal segments 9–15; 39, female 4th and 5th tarsomeres and claws of hind leg; 40, 4th tarsomere, dorsal view; 41, male 9th segment, basistyle and aedeagus; 43, parameres; 44, basistyle.

ly due to great length of basistyle (Fig. 46) which is nearly 3 × as long as wide, and about 1,5 × as long as 9th tergum; at its inner base each basistyle bears a large thumb-like projection; dististyle of nearly even width throughout, bent in middle and toothed at apex. Ninth sternum slightly concave at its distal margin; 9th tergum short compared with basistyle, apicolateral processes small. Aedeagus (Fig. 47) apparently jointed and distal portion forked. Parameres (Figs 48–49) fused, at least partly, apex forked; on each side joined to basistyle by a long apodeme.

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: N.W. Cape, Springbok, ix.1983, G. van Eeden, UVL trap (SAIMR).

This species is intermediate in several respects between *Bothahelea* and *Brachypogon*, subgenus *Isohelea*, but its affinities with *Bothahelea* are closer. Important characters allying it with *Bothahelea* are minutely pubescent eyes, male flagellar segments not fused, presence of a weak sensilla basiconica on third antennal segment, two complete somewhat elongate radial cells, and the subapically constricted male 9th tergum. The costal ratio (0,58) is low for *Bothahelea* (0,65–0,70) and the fused parameres, elongate basistyles and simple aedeagus are like those of *Isohelea*. The generic position will be ascertained with more certainty when the female is discovered.

Genus *BRACHYPOGON* Kieffer

Brachypogon (Brachypogon) corius De Meillon & Hardy, Figs 31–32.

This species was originally described from the male collected at Franschhoek, Cape Province; we now describe the female from the eastern Transvaal.

FEMALE. Wing length 0,72 mm.

Head. Black dorsally, face dark brown. Eyes narrowly separated by width of about 2 facets; hairy. Antenna short, flagellum equal in length to width of head; segments 3 and 11–15 slightly infuscated; segments 4–10 slightly longer than wide, 11–12 subequal, each about 2 × as long as wide; antennal ratio (11–15/3–10), about 1,0. Palpus with segments 3–5 as in Fig. 31, segment 3 with small deep sensory pit.

Thorax. Dark brown to black, mesonotum without strong bristles except above wing bases. Wing milky, end of costa and radius covered by dense black spot; media and cubitus clearly visible only in dry wing, M2 missing; alula bare; macrotrichia absent; costal ratio 0,58. Halter pale. Legs with all femora dark brown and unarmed; tibia and tarsi white; fore tibia without strong bristles apically, but with stout transparent apical spur longer than width of tibia; hind tibia apically with strongly slanted row of 6 long transparent bristles (a subapical comb could not be identified with certainty, apical spur appeared to be small, spine-like and transparent). Apex of hind tibia very much like that of *B. grobleri* De Meillon & Wirth and *B. hamiltoni* De Meillon & Wirth. Hind basitarsus with complete row of palisade setae, otherwise all other tarsomeres unarmed; 4th tarsomeres cordiform; claws delicate, simple and equal on all legs.

Abdomen. Paler than thorax, terminal segments not strongly sclerotized; sternum 8 with deep triangular incision. Spermatheca single, pale brown, shaped as in Fig. 32, and measuring, including enlarged neck, 1,078 × 0,047 mm.

New Records. SOUTH AFRICA: Transvaal, Arabie, Olifants River, 20.ix.1982, H. Cross, UVL trap, 1 ♂ 2 ♀ (NM, USNM).

The females of 6 Subsaharan species of the subgenus *Brachypogon* are known. Of these, *B. brazzai* (Vattier & Adam) and *B. emphuxi* (Vattier & Adam) have a single spermatheca and in both the male is unknown. Their status as valid species is questionable until males are available for study.

Brachypogon (Isohelea) africanus (De Meillon), Figs 33–45

We take this opportunity to offer redescriptions of the male and female from material in better condition than previously available, and to figure the female. A small dark species with paler abdomen except genitalia darker and slightly enlarged; wing with 2 radial cells, 4th tarsomere cylindrical.

MALE. Wing length 0,64–0,83 mm.

Head. Dark brown to blackish, frons paler. Eyes separated by width of about 4 facets; bare. Antenna short; torus black, remainder dark brown; segment 3 with narrow stalk and a sensillum coeloconicum (Fig. 35); 4–12 fused, apex of 13 and whole of 14 and 15 free (Fig. 34); relative lengths of 13–15 are 25–20–21; plume well developed. Palpus (Fig. 37) paler than antenna, 5-segmented; 3rd segment slightly swollen apically where it bears a large, deep sensory pit; relative lengths of 3–5 are 12–10–15.

Thorax. Dark brown to black including pleuron, scutellum and postnotum. Scutellum with 3–4 long bristles; mesonotum with scattered slightly curved hair-like bristles except above wing bases where they are much longer and straight; upper meskatepisternum with a single strong bristle measuring about 0,05 mm; pleuron otherwise bare. Wing (Fig. 33) unmarked, in dry mount radius and 2 radial cells visible and base of M2 and apex of Cu2 interrupted; in specimens mounted in balsam only the costa is clearly visible; macrotrichia absent, microtrichia minute; alula bare; costal ratio 0,50–0,53. Legs with coxae, femora and tibiae dark brown, unarmed, not enlarged; tarsi paler. Fore tibia with slanted comb of long fine teeth apically, and a spine-like apical spur about as long as tibia is wide; basitarsus with small black spine apically. Mid leg as for fore leg but without comb or spur. Hind tibia with long slanted comb of short spine-like teeth and slanted row of 8 strong dark bristles, much as in *B. hamiltoni*; apical spur short, strong and trifid; basitarsus straight, with complete row of pale palisade setae and small dark spine apically; 2nd and 3rd tarsomeres each with similar spine apically. Tarsomere 4 (Fig. 40) on all legs cylindrical, nearly 3 × as long as wide; all claws small, simple, and only slightly curved.

Abdomen. Brown with apex darker and genitalia slightly swollen. Ninth sternum (Fig. 41) narrow, its distal margin slightly convex; tergum well developed, reaching to apex of basistyles; basistyle (Fig. 44) oval with a few fine setae only, on inner side near middle with a strongly developed projection to anchor paramere of 1 side (Fig. 41), parameres (Fig. 43) separate, each bent near middle as figured and of complicated structure basally where attached to projection of basistyle; dististyle (Fig. 45) short, stout, and narrowing to beak-like tip; aedeagus (Fig. 41) a simple sheet-like structure, largely transparent and difficult to discern.

FEMALE. General appearance as in male, differing mainly as follows: Wing length 0,77–0,84.

Head. Eyes slightly closer together. Mandible with 7–9 small sharp teeth. Antenna (Fig. 36) relatively longer than in male but still short, being only slightly longer than hind femur; segment 3 with short stalk, 4–9 subglobular, 10 slightly longer than wide, 11–15 about 2 × as long as wide; relative lengths of 10–15 are 8–10–10–12–12–14; antennal ratio (11–15/3–10), 1,0.

Thorax. Claws on all legs longer than on male, slightly unequal, shorter being thinner, longer slightly shorter than 5th tarsomere and with a fine short sharply pointed internal tooth on each leg, (tooth well hidden and difficult to see) (Fig. 39).

Abdomen. Spermathecae (Fig. 38) 2, pyriform, dark brown, allotype measuring 0,073 × 0,049 mm and 0,047 × 0,036 mm including the short necks. Genital sclerotization as in Fig. 42.

New Records. SOUTH AFRICA: Transvaal, Phalaborwa, 22.i.1980, G. van Eeden, UVL trap, 2 ♂ 5 ♀ (SAIMR, NM, BMNH, USNM).

The species is distinguished from the other Subsaharan species of the subgenus *Isohelea* by the shape of the male parameres.

Genus *FANTHAMIA* De Meillon

Fanthamia abditus sp. nov., Figs 135–137

MALE. Wing length 0,68 mm.

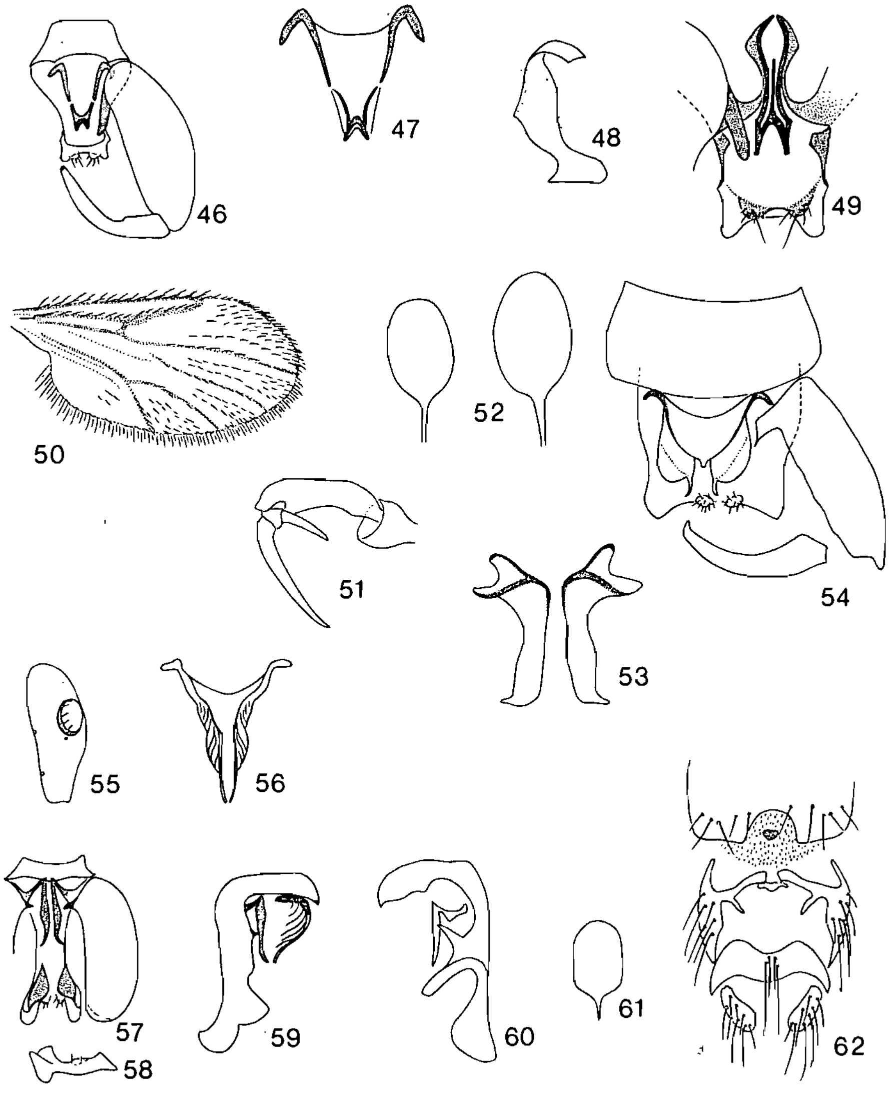
Head. Brown. Eyes widely separated by width of 4–5 facets; bare. Antenna light brown except torus which is slightly darker; like that of ♀ without a plume and distal 5 segments elongated; minute sensilla coeloconica present on segments 11–14; relative lengths of 10–15 are 8–13–12–12–12–15. Palpus 5-segmented; segment 2 slightly longer than 3, 4 or 5 which are subequal; 3rd without sensory pit.

Thorax. Entirely brown to dark brown, without distinguishing features. Wing pale, somewhat dusky bordering veins; a few macrotrichia towards wing tip; costal ratio 0,52. Legs paler than thorax, unarmed and not swollen; fore tibia with short slanted comb of fine teeth and long strong spine-like apical spur; on hind tibia comb is much longer and apically there is a row of about 6 strong bristles, and the apical spur is quite short and pectinate. Tarsi without strong ventral spines; hind basitarsus with complete row of palisade setae; 4th tarsomeres cordiform; claws small, equal and simple.

Abdomen. Light brown including genitalia which are small and fragile; details shown in Figs 135–137.

FEMALE. Generally similar to male except as follows. Wing length 0,66 mm. Antennal segments 3–10 gradually increasing in length; relative lengths of 10–15 are 11–11–11–11–12–15. Palpus with relative lengths of segments 5–10–8–7–8; segment 3 with small shallow sensory pit. Mandible with 6 sharp teeth. Tarsal claws moderately long and curved, equal on fore and mid legs, longer and slightly unequal on hind leg. Spermathecae 2, small, subequal and strongly sclerotized; each measuring 0,023 mm × 0,018 mm plus slender neck 0,012 mm long.

MATERIAL EXAMINED. Holotype ♂, allotype ♀, 1 ♂ 2 ♀ paratypes: SOUTH AFRICA: Cape Province, Knysna, Diepwalle, 12–30.xii.1981, S. & J. Peck, malaise forest trap (Holotype, allotype SAIMR; 1 ♂ 1 ♀ paratype USNM; 1 ♂ paratype NM).



Figs 46–49, *Bothahelea nama* ♂; 50–54, *Fanthamia jonkeri*; 55–59, *F. equilis*; 60, *Kolenohelea inusitata* ♂; 61–62, *K. uysorum* ♀: 46, 54, 9th segment, basistyle, dististyle, aedeagus; 47, 56, aedeagus; 48, paramere, side view; 49, parameres and 9th tergum; 50, female wing; 51, female 4th and 5th tarsomeres and claws; 52, 61, spermathecae; 53, parameres; 55, 3rd palpal segment; 57, 9th segment, basistyle, and parameres; 58, dististyle; 59, 60, 9th segment, parameres, and aedeagus in side view; 62, distal abdominal segments, ventral view.

Fanthamia jonkeri sp. nov., Figs 50–54

A small dark brown to blackish species with plain wing and unbanded legs, much resembling *F. carina* De Meillon & Hardy, but male genitalia different.

MALE. Wing length 0,83 mm.

Head. Dark brown. Eyes widely separated, hairy. (Antenna missing on both specimens). Palpus short; segments 2–5 subequal, 3 with small shallow sensory pit near inner apical angle.

Thorax. Uniformly dark brown; scutellum slightly paler, with 6 bristles. Wing colourless, veins visible; 1st radial cell long and narrow, 2nd not formed; macrotrichia restricted to apex of wing; alula bare; costal ratio 0,60. Legs paler than thorax, without black spines, segments not enlarged; fore tibia with short apical comb of quite long fine teeth, apical spur as long as width of tibia, hyaline and spine-like; hind tibia apically with long slanted comb of fine teeth and slanted row of 7 bristles much as in some *Brachypogon*, apical spur short and spine-like; hind basitarsus straight, strong, with complete row of palisade setae and no strong black spines; no modified hairs elsewhere on legs; 4th tarsomeres cordiform; claws small; nearly straight, simple and subequal on all legs.

Abdomen. Slightly paler than thorax. Genitalia (Figs 53–54) of type in *F. carina* and *F. adulator* De Meillon, but aedeagus unique in consisting of a central shield supported on each side by a wing-like flange; broad, flat parameres (Fig. 53) are also unique.

FEMALE. Generally as in male. Wing length 1,01–1,04 mm. Eyes separated by width of 8–9 facets. Antenna 3rd segment with short stalk, segments 4–10 vasiform and gradually lenthening, 10 about 2 × as long as wide, 10–15 with relative lengths 13–15–15–13–15–20; antennal ratio (11–15/3–10) 0,8. Palpus with sensory pit on segment 3 deeper than in male. Mandible with 8 small teeth. Wing (Fig. 50) slightly longer than in male with a few more macrotrichia; costal ratio 0,62. Legs with hind claws unequal (Fig. 51), longer claw about as long as 5th tarsomere, shorter about half this length; all claws simple. Spermathecae 2, ovoid, dark brown, each with long sclerotized neck (Fig. 52) measuring 0,083 × 0,036 mm and 0,065 × 0,029 mm including length of neck.

MATERIAL EXAMINED. Holotype ♂, allotype ♀, paratypes 1 ♂ 2 ♀: SOUTH AFRICA: Cape Province, Stellenbosch, Jonkershoek, V. 1983, J. Giliomee, in light trap (Holotype, allotype SAIMR; 1 ♂ 1 ♀ paratypes USNM; 1 ♀ paratype NM).

The plain wing, distinctive male genitalia and unequal hind female claws serve to identify this species and separate it from the closely allied *F. carina* which is known only from the nearby locality of Franschhoek, Cape Province.

Genus *KOLENOHELEA* De Meillon & Wirth

Kolenohelea equilis sp. nov., Figs 55–59

The specific epithet is from the Latin 'equile' = 'home for horses', named for the type locality Paardeplaas, the Dutch word for 'horse farm'.

Male. Wing length 1,1 mm.

Head. Brown; eyes separated by slightly less than width of 2 facets, bare. Antenna 3rd segment with long stalk, 4–11 slightly longer than wide, not clearly separated from one another; 12 somewhat modified, somewhat swollen and without any plume setae, densely covered with microtrichia; segments 12–15 with relative lengths 13–40–40–40; with terminal bristle; antennal ratio (12–15/3–11), 0,9. Palpus (poorly displayed) with 3rd segment slightly swollen, with a demarcated but shallow sensory pit subapically.

Thorax. Mesonotum and postnotum dark brown, pleuron and scutellum slightly paler, latter with 5 strong bristles and some smaller ones. Wing typical of genus, unornamented; 2nd radial cell 2 × as long as 1st; a few macrotrichia at apex; costal ratio 0,64. Legs with coxae and trochanters light brown, those of mid and hind legs slightly darker; femora, tibiae and tarsi of fore and mid legs pale brown, those of hind legs darker. Fore leg femur slightly swollen, tibia with very strong, straight apical spur; basitarsus with strong spine subbasally, a weaker one subapically, and another apically; tarsomeres 2–5 unarmed. Mid leg femur and tibia unarmed; basitarsus with a few small colourless thin spines along its length; tarsomeres 2–5 unarmed. Hind leg femur definitely swollen, slightly less than 4 × as long as wide in middle, unarmed; tibia with slanted row of 7 spines and a small but stout, brush-like apical spur; basitarsus as usual in genus, strong, arcuate, a very strong spine at base and a smaller one apically, palisade setae strong, spine-like; tarsomeres 2–5 unarmed. Fourth tarsomeres on all legs with pair of long whip-like hyaline sensory hairs; all claws small, very slightly curved, simple and equal.

Abdomen. Brown, genitalia darker. Genitalia (Figs 55–59) typically large, with great development of 9th tergum and basistyles as in Fig. 57; apical development of 9th tergum (Figs 57, 59) and dististyle (Fig. 58) quite specific; exact shape of latter difficult to determine and varying appreciably according to angle from which it is viewed; aedeagus and parameres (Fig. 57) similar to those of several other species (compare *K. inusitata* De Meillon & Wirth, Fig. 60).

Material examined. Holotype ♂: SOUTH AFRICA: Transvaal, Paardeplaas, Letaba, 10.i.1980, G. van Eeden, UVL trap (SAIMR).

The male genitalia are unique and readily serve to distinguish the species, as mentioned in the description.

Kolenohelea inusitata De Meillon & Wirth, Fig. 60

Originally described from M'Seleni, KwaZulu, from a single male, we now have another male from Tzaneen in the northern Transvaal and can give details of antennal measurements that were missing from the original description. We also give an illustration of a side view of the 9th abdominal segment which shows the great development of the lobe at the base of the apicolateral process (Fig. 60) that is not apparent in ventral view.

Antenna. Segments 4–11 slightly barrel-shaped, gradually decreasing in width, 11 slightly longer than wide; relative lengths of 11–15 are 12–18–42–34–39; 15 with an apical bristle; antennal ratio (12–15/3–11), 1,0. Wing: wing length 1,1 mm; a few macrotrichia present on wing tip.

Material examined. SOUTH AFRICA: Transvaal, Tzaneen Town, 6.xi.1980, H. Cross, UVL trap 1 ♂ (SAIMR).

Kolenohelea leonina sp. nov., Figs 138–141

Typical of the genus in all respects; differing from its congeners in details of the male genitalia. Specimen damaged; female unknown.

MALE. Wing length about 1,0 mm (wing damaged).

Head. (Missing).

Thorax. Uniformly brown with strong bristles along sides and a few dorsally. Wing unicolourous, veins well marked; 2nd radial cell slightly less than 2 × as long as 1st; end of costa about in line with termination of Cu1; base of M2 interrupted; a few macrotrichia along apical margin only. Legs brown as in thorax; femora unarmed, those of hind leg appreciably enlarged; hind tibia with usual subapical comb of fine teeth and apical row of 7 strong bristles, apical spur short and brush-like; basitarsus as in other species; fore tibia apically with short comb and a strong but pale, spine-like apical spur which is longer than width of tibia; fore basitarsus with 2–3 pale spines of which the basal one is rather strong, spines on other leg segments not conspicuous; 4th tarsomeres moderately cordiform, bearing the typical whip-lash sensilla. Claws quite small, simple and equal.

Abdomen. Paler than thorax; terminal segments not strongly sclerotized. Genitalia (Figs 138–141): 9th tergum elongated and apicolateral processes enlarged (Fig. 141); immediately separable from all other species by the claw-like apex of dististyle (Fig. 138), and the very heavy bristles on 9th tergum (Fig. 141), these bristles are arranged in a distal, closely set, semicircular raised row of 8, and a few scattered ones proximally. The boot-like parameres (Fig. 139) basically similar to those seen in some other species, especially *K. uysorum* De Meillon, Meiswinkel & Wirth, but more slender and with foot of boot longer. Basistyle about 2 × as long as wide, with prominent, sharp, triangular spur internally at base. Aedeagus (Fig. 139) with main body transparent and difficult to define precisely; apically split into a pair of weakly sclerotized projections which reach just beyond apices of parameres. Sternum 9 with strongly convex distal margin.

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: Cape Province, Knysna, 22.x.1971, R. M. du Toit (SAIMR).

Kolenohelea pedi sp. nov., Figs 142–150

A medium-sized, plain-winged, brown to dark brown species, immediately recognizable by the male genitalic characters.

MALE. Wing length 1,3 (1,1–1,4) mm.

Head. Dark brown. Eyes separated by width of about 2 facets, bare. Antenna short, about 0,6 × length of wing; torus and segments 13–15 dark brown, 3–12 paler; 4–12 not clearly separated; plume well developed; relative lengths of 11–15 are 12–16–50–43–42. Palpus pale; 3rd segment slightly swollen at apex where it bears a shallow sensory pit.

Thorax. Mesonotum and pleuron uniformly dark brown; scutellum slightly paler, bearing 6 bristles; mesonotum with usual strong bristles above wing bases and along sides, dorsally with a few bristles and some fine delicate setae; pleuron bare. Wing unadorned, veins well marked; microtrichia dense and minute, macrotrichia mainly confined to distal margin and along posterior margin to end of vein M1; radial cells open, well developed, 1st slightly more than half as long as 2nd; vein M2 interrupted basally; alula fringed; costal ratio 0,65 (0,59–0,65). Halter with 2 minute spine-like setae. Legs brown to dark brown; femora unarmed, that of hind leg moderately swollen; fore tibia with apical slanted comb of numerous long fine teeth and very strong, brown, pointed spur slightly longer than width of tibia; fore basitarsus with 3 short brown spines (1–3), basal one darker and longer; mid basitarsus with 7 pale short spines (4–7); hind tibia subapically with strongly slanted comb of numerous short teeth and apical row of 7 long bristles (6–8), apical spur short, strong and pectinate; hind basitarsus typical, somewhat arcuate, short and strong, bearing a strong black spine basally and a shorter one apically, and with usual palisade setae running length of segment; 4th tarsomeres not definitely cordiform, slightly longer than wide with typical long whiplash-like sensilla; all claws simple, equal, short and only slightly curved.

Abdomen. Paler than thorax but with genitalia slightly darker. Genitalia (Figs 145–148) large, prominent and typical of genus; 9th sternum short, with slightly convex distal margin; tergum well developed, longer than basistyles, apicolateral processes greatly enlarged (Figs 145, 147); basistyle about 3 × as long as wide; dististyle (Fig. 146) of even width throughout, apical third curved inwards. Aedeagus (Fig. 148) of normal shape; parameres (Fig. 148) separate, more or less parallel-sided and gently curved at apex to end in sharp point.

FEMALE. General appearance as in male. Wing length 1,3–1,4 mm.

Head. Coloration and eyes as in male; mandible with 7–8 triangular teeth. Antennal segments 4–10 barrel-shaped, each about 2 × as long as wide; relative lengths of 10–15 are 16–26–26–29–29–32; palpus (Fig. 142) as in male but segment 3 more expanded apically and sensory pit deeper.

Thorax. Mesonotum as in male but with more strong bristles. Wing with microtrichia very dense, giving wing slight dusky appearance, veins even more clearly defined than in male; radial cells and base of M2 as in male; costal ratio 0,71 (0,68–0,73), thus larger than in male. Legs generally as in male, with hind femur noticeably swollen; fore, mid and hind tibiae and basitarsi with similar numbers and shapes of spines, setae and combs, those on fore and mid basitarsi typically variable in number; 4th tarsomeres as in male but more nearly cordiform; 5th tarsomeres with a single long claw bearing a short blunt tooth at the base; fore claws (Fig. 143) longest (compare hind claw (Fig. 144)), means and ranges in reticule units for fore, mid and hind legs: 32,4 (30–35, n = 17), 27,2 (26–31, n = 17) and 26,4 (24–29, n = 17), respectively.

Abdomen. Paler than thorax, terminal segments (Fig. 150) similar to those of *K. uysorum*. Spermathecae (Fig. 149) 2, typical in shape, one slightly larger; including long neck 0,098 × 0,062 mm and 0,084 × 0,052 mm.

MATERIAL EXAMINED. Holotype ♂, allotype ♀; paratypes 1 ♂ 1 ♀: SOUTH AFRICA: Cape Province, Knysna, 22.x.1971, R. M. du Toit, taken at light (holotype, allotype SAIMR; paratypes USNM).

The shapes of the dististyle, parameres and apex of the 9th tergum easily separate *K. pedi* from other males in the genus. Females are little-known; two, *K. mira* De

Meillon & Wirth and *K. luciae* De Meillon & Wirth, have spotted wings, while *K. mirifica* De Meillon & Wirth has a single spermatheca; so they are easily recognized. Other females known are of *K. dycei* De Meillon & Wirth, *K. uysorum* and the present species. So far no characters have been found to separate these females with any certainty. The name is from *'pedum'*, Latin for a shepherd's crook.

Kolenohelea pugilator sp. nov., Figs 151–157

A large uniformly dark brown species; wing unicolorous, second radial cell about 3 × length of first. The species, because of the shape of the dististyle, is named for the gladiators who fought in the Roman arenas with gloves made of leather thongs.

MALE. Wing length 1,8 mm.

Head. Brown. Eyes separated by width of 1 facet; bare. Antenna with torus dark brown, flagellum paler; segments 4–11 barrel-shaped, each about 2 × as long as wide; relative lengths of 11–15 are 20–30–65–70–60; antennal ratio (12–15/3–11) 1,1. Palpus brown, 5-segmented; segment 3 long, slender and parallel-sided, with small sensory organ near inner apex.

Thorax. Dark brown, scutellum slightly paler; mesonotum with strong bristles, especially laterally and above wing base; scutellum with 10 strong bristles and a few small hairs. Each halter with 5–6 minute, stiff strong hairs; pleuron bare, brown. Wing (Fig. 152) unicolorous; microtrichia minute, macrotrichia restricted to apex, not extending proximad beyond end of costa; 2 open radial cells, 2nd about 3 × length of 1st; costal ratio 0,78; base of M2 narrowly interrupted. Legs slightly paler than thorax; hind femur enlarged, unarmed like those of other legs; fore tibia (Fig. 151) with short transverse comb of strong teeth and an exceptionally strong black spur; hind tibia with subapical slanted comb of numerous fine long teeth and apical row of 7 long pale bristles, apical spur small, pale and pectinate; fore basitarsus with 6 short, strong black spines; mid basitarsus with 5 paler and weaker spines; hind basitarsus slightly arcuate, with 1 strong black spine basally and another apically, row of palisade setae complete; tarsomeres 2 and 3 on all legs each with 1–2 pale small thin spines; tarsomere 4 longer than wide and not cordiform, provided with typical whiplash-like sensilla. Inner and outer claws equal on all legs, but claws on fore and hind leg (Fig. 154) strong, and larger than on mid leg (Fig. 153).

Abdomen. Dark brown like thorax. Genitalia (Figs 155–157) large and typical of genus. Ninth tergum (Fig. 157) with elongated apicolateral processes which are expanded and truncated apically; basistyle stout, about 2 × as long as wide; dististyle (Fig. 156) darker, stout, shaped like a human fore-arm with clenched fist. Parameres (Fig. 155) separate, each sclerotized and shaped as illustrated. Aedeagus (Fig. 155) with strong basal arms and long, paler, median extension to near apex of basistyle; apex minutely toothed (a feature that calls for careful focusing at × 400).

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: Cape Province, Knysna, Diepwalle, 12–30.xii.1981, S. & J. Peck, Malaise forest trap (SAIMR).

Though not completely conforming with the original definition of the genus (De Meillon & Wirth 1981*a*), there is little doubt that *K. pugilator* belongs in *Kolenohelea*. The second radial cell is rather long but this is shared by *K. mirifica*; the fifth tarsomere is not cordiform, but some other species also show this feature. *K. pugilator* is easily separable from other species in the genus by the structure of the male genitalia, especially the fisted, arm-like dististyle and the greatly elongated aedeagus. The great development of the anterior spur on the fore tibia is also diagnostic and should identify the female.

Kolenohelea uysorum De Meillon, Meiswinkel & Wirth, Figs 61–62

Hitherto only the male of this species was known, and here we describe the female.

FEMALE. Wing length 1,20–1,27 mm.

Head. Somewhat elongate; dark brown dorsally, face and mouthparts slightly paler; eyes narrowly separated by width of 1 facet, bare. Antenna dark brown throughout with scarcely any change in colour from 3–15; segments 4–10 gradually narrowing, 10 nearly 2 × as long as wide; relative lengths of 10–15 are 13–19–19–23–22–26; antennal ratio (11–15/3–10), 1,1. Palpus brown, longer than proboscis, 3rd segment nearly parallel-sided and with definite sensory pit, nearly as deep as wide, near inner apical corner; relative lengths of segments 2–5 are 2–2–1–2. Mandible gradually narrowed to apex, with 8 teeth.

Thorax. Uniformly dark brown; scutellum slightly paler, bearing 6 large bristles and a few delicate hairs; pleuron bare. Wing unornamented, but area enclosed by radius infuscated; distally with macrotrichia not quite reaching end of costa; costal ratio 0,6; 2nd radial cell 2 × length of 1st. Legs dark brown, tarsi slightly paler; all femora and tibiae, but especially those of hind leg, noticeably enlarged, all unarmed; apex of fore tibia with short comb of long fine teeth and stout, straight, sharp spine-like anterior spur slightly shorter than width of tibia; hind tibia with long slanted comb of fine teeth, a slanted row of 8 strong bristles, and a small brush-like apical spur; hind basitarsus short arcuate and typical of genus, with complete row of palisade setae and a short strong black spine at base and apex; 4th tarsomeres cordiform, bearing whip-like hyaline sensilla typical of genus; 5th tarsomeres unarmed, with strongly unequal claws on all legs.

Abdomen. Uniformly dark brown; terminal segments as in Fig 62. Spermathecae (Fig. 61) 2, elongated, about 1,5 × as long as wide, sclerotized and measuring 0,078 × 0,052 mm and 0,065 × 0,042 mm, not including length of sclerotized duct as shown.

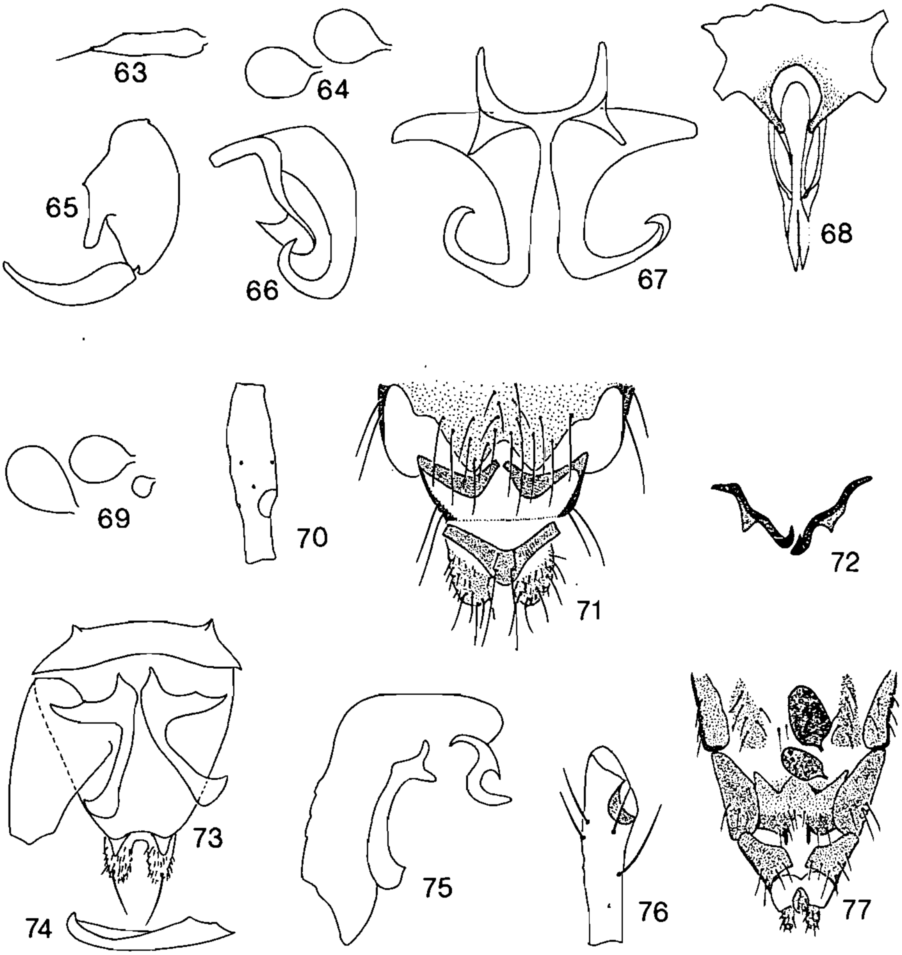
MATERIAL EXAMINED. SOUTH AFRICA: Transvaal, 'Die Tuine', Tzaneen, x.1982, Maureen Coetzee, UVL trap, 2 ♂ 3 ♀, (NM, SAIMR, USNM).

Though closely resembling the female of *K. dycei* De Meillon & Wirth, the genital sclerotizations are different (e.g. the 8th sternum which is completely divided in *K. dycei* and not in *K. uysorum*).

Genus *MONOHELEA* Kieffer

Monohelea (Allohelea) maureenae sp. nov., Figs 63–68

A typical member of the subgenus, differing from other Subsaharan species principally in male genitalic structure.



Figs 63–68, *Monohelea maureenae*; 69–75, *Stilobezzia flavida*; 76–77, *S. trimaculata*; 63, male terminal antennal segment; 64, 69, spermathecae; 65, basistyle and dististyle; 66, aedeagus and parameres, side view; 67, parameres; 68, 72, aedeagus; 70, 76, female 3rd palpal segment; 71, 77, genital segments, ventral view; 73, 9th segment, basistyle and parameres; 74, dististyle; 75, 9th segment, parameres and aedeagus in side view.

Male. Dorsally dark brown to black, face paler; eyes separated by width of 1–2 facets, bare. Antenna with torus, 3rd segment in mid-portion, and 4–12 apically, and all of 13–15 dark brown, rest paler; 3 about as long as 4–6 combined, 4–11 barrel-shaped and gradually narrowing, 11 slightly longer than wide; relative lengths of 11–15 are 13–20–40–37–38; 15 pointed apically and carrying a strong terminal bristle (Fig. 63); antennal ratio (12–15/3–11) 0,85. Palpus 5-segmented, pale but segment 5 definitely infuscated, segment 3 slightly swollen with shallow sensory pit just beyond middle; relative lengths of 2–5 are 14–17–16–20.

Thorax. Mesonotum dark brown throughout, except scutellum which is yellow with dark centre, and bearing a pair of strong, black spinelike bristles medially and another on each side; supra-alar bristles and the single bristle on proepisternum similar; mesonotum with relatively sparse short but strong curved hairs; pleuron bare. Wing as in other species of subgenus; costal ratio 0,72; both radial cells narrow, 2nd about 2 × as long as 1st; no macrotrichia, microtrichia minute. Legs with hind femur and tibia uniformly black, slightly stouter than on other legs; hind tarsus pale yellow or light brown; apex of tibia with row of 5–6 thin short setae, a subapical comb of numerous teeth, and an apical short pectinate black spur; basitarsus short, about as long as tarsomeres 2 + 3, slightly arcuate, a strong black spine at base and apex, and a complete row of palisade setae; tarsomere 2 with pair of similar spines at apex, tarsomeres 3–5 without such spines; tarsomere 4 longer than 3 and about as long as 5 which has a single strong claw slightly longer than tarsomere iself, with a small tooth present at its base. Fore and mid legs light brown with paler tarsi and without heavy black spines or bristles except basally on fore basitarsus; fore tibia with transverse comb of numerous closely set teeth and short hyaline spine-like apical spur; claws on fore and mid legs small, nearly straight, each talon with small internal spine at base.

Abdomen. Dorsally dark brown to black, venter paler, especially on proximal segments. Genitalia (Figs 65–68) as in subgenus with some striking specific differences: basistyle (Fig. 65) with an exceptionally large thumb-like process midway on its inner margin, and each paramere (Figs 66–67), though joined basally as usual, with distal portion greatly elongated and bent ventrolaterad and strongly curved (in 1 specimen curved around thumb-like projection of basistyle). Aedeagus (Figs 66–68) of usual type, differing in detailed structure from its congeners.

Female. Wing length and pattern as in male (antenna lost). Mandible with 8 small teeth. Thorax and legs coloured and armed as in male but 4th tarsomere of hind leg with pair of strong black spines as on tarsomeres 1–3; 4th and 5th tarsomeres appear to be fused; claws as in male. Abdomen dark brown, apical segments not strongly sclerotized (precise shape of 8th and 9th segments could not be determined). Spermathecae (Fig. 64) 2, pale, pyriform, subequal (partly collapsed) including sclerotized necks, 0,080 × 0,042 mm and 0,062 × 0,042 mm.

Material examined. Holotype ♂, allotype ♀, paratypes 3 ♂: SOUTH AFRICA: Transvaal, Tzaneen, Peace Street, 4.ii.1983, Maureen Coetzee, UVL trap. (Holotype, allotype SAIMR; 1 ♂ paratype each, USNM BMNH, NM).

The species is named for the collector, Maureen Coetzee. The dark thorax and hind femur and tibia place the species near *M. makonde* De Meillon & Wirth but the genitalia will serve to separate it from this and all other Subsaharan species of which the male is known. There are three species, *M. litoaurea* Ingram & Macfie and

M. nigeriae Ingram & Macfie from West Africa, and *M. pulchripennis* Kieffer from the Seychelles, in which males are known. They all differ from *M. maureenae* in being much paler. The female differs from that of *M. makonde* in having the hind femur and tibia less enlarged and the hind claw shorter than tarsomeres 4 and 5 combined.

Genus *SERROMYIA* Meigen

Serromyia agathae De Meillon & Wirth

New Record. SOUTH AFRICA: Cape Province, Knysna, Diepwalle, 12–30.xii.1981, S. & J. Peck, Malaise forest trap 3 ♂ 5 ♀ (NM, USNM).

The extension of the known range of this species from the Drakensberg in E. Transvaal to Knysna in Cape Province illustrates how premature would be any attempt at zoogeographic analysis of the ceratopogonid fauna of southern Africa at this time.

Genus *STILOBEZZIA* Kieffer

Stilobezzia (Neostilobezzia) flavida sp. nov., Figs 69–75

A uniformly light brown species without any ornamentation and typical of the subgenus, distinctive principally in the characters of the male genitalia.

Male. Wing length 1,32 mm.

Head. Light brown; eyes narrowly separated, bare. Antenna light brown except for torus and segments 13–15 which are slightly darker; segment 3 about 3 × as long as wide, 4–12 somewhat barrel-shaped, gradually narrowing from less than 2 × to 3 × as long as wide, 13–15 greatly elongated, relative lengths of 12–15 are 10–25–36–36; 15 with terminal bristle in one antenna and slightly subterminal in the other. Palpus (Fig. 70) 5-segmented, 3rd segment parallel-sided until just past middle where it narrows, no sensory pit visible; segments 2–5 with relative lengths 11–27–13–23.

Thorax. Light brown to brown with several rows of short to medium, strong spine-like setae; scutellum paler, with 5–6 strong bristles and no small hairs; postnotum darker than mesonotum; pleuron light brown, bare. Wing typical of subgenus; costal ratio 0,68; radial cells well formed, 2nd about 2 × as long as first; macrotrichia restricted to apex. Legs uniformly light brown, without strong bristles or spines; fore tibia with slanted apical comb of closely set transparent teeth and a spine-like apical spur which is longer than width of apex of tibia; hind tibia with a similar slanted comb subapically, a row of 8 strong but pale bristles apically, and a small apical spur; hind basitarsus longer than tarsomeres 2–5 together, narrow and with 3 complete rows of modified hairs; 4th tarsomere cordiform on all legs, each with a simple short curved hyaline sensory hair; 5th tarsomeres unarmed; claws small, equal, each bifid apically.

Abdomen. Concolorous with thorax. Genitalia (Figs 72–75) differing from other species in shape of apex of paramere (Fig. 73); lateral sclerites of aedeagus (Fig. 72) bent ventrally in side view (Fig. 75); narrow 9th sternum with a long but shallow excavation along posterior margin; these characters and shape of dististyle (Fig. 74) distinguish the species.

FEMALE. Wing length 1,47 mm. Resembles male except for the following.

Head. Antenna longer than wing; segment 3 parallel-sided without stalk and nearly 4 × as long as wide; 4–7 parallel-sided, each nearly 3 × as long as wide; 8–10 somewhat vase-shaped and slightly longer; relative lengths of 10–15 are 12–24–24–23–22–30; 15 with terminal bristle (on 1 antenna segments 4 and 5 fused). Palpus light brown, much longer than proboscis, 5-segmented; relative lengths of 2–5 are 1–2–1–1; segment 3 as in male constricted near apex where the ring of a sensory organ can be seen, but no pit (Fig. 70). Mandible with 6 rather small teeth on one edge and 2 subapical teeth on other edge.

Thorax. As in male. Wing slightly longer than in male, 2nd radial cell about 3 × length of 1st; macrotrichia more numerous but still mainly restricted to distal half of wing; costal ratio 0,73. Legs as in male but claws very unequal, longer slightly shorter than 5th tarsomere and about 2 × as long as shorter claw; no significant difference in lengths of claws between legs.

Abdomen. Colour as in male; terminal segments slightly sclerotized, form as in Fig. 32. Spermathecae (Fig. 69) 3, lightly pigmented, 2 pyriform, (before collapse in balsam) 0,078 × 0,047 mm and 0,065 × 0,044 mm, 3rd very small and subglobular, 0,016 mm in diameter.

MATERIAL EXAMINED. Holotype ♂, allotype ♀: SOUTH AFRICA: Transvaal, Cobra Mines, (23° 58′ S, 30° 37′ E), 30.ix.1982, H. Cross, UVL trap (SAIMR).

On the evidence of the male, this species is closely related to *S. limai* Wirth & Derron from São Tomé, West Africa; the shape of the apex of the paramere separates it immediately, as does the shallow but long excavation along the distal margin of the 9th sternum. The female, if correctly associated with the male, resembles that of *S. vandeli* Vattier & Adam and that of *S. longicornis* Goetghebuer as redescribed by De Meillon (1959). In these two species the wing length is greater (1,6 and 1,8 mm respectively). In *S. vandeli* the mandible has eight teeth and in *S. longicornis* the longer talon is 3 × as long as the shorter; also in the latter the abdomen is said to be dark brown in contrast to the paler thorax.

Stilobezzia (Neostilobezzia) trimaculata sp. nov., Figs 76–77

A striking species with a median dark stripe on the mesonotum and scutellum, the wing ornamented with three well-defined dark spots and the veins well delineated, the abdomen creamy dorsally and ventrally, and darker laterally, the hind femur dark brown with a narrow pale band near apex.

FEMALE. Wing length 1,80 mm.

Head. Dark brown dorsally, face and clypeus paler; eyes separated by width of 2 facets, bare. Mandible with 7 large teeth. Antenna with torus brown, segments 3–7 paler, 8–15 slightly infuscated; relative lengths of 10–15 are 13–20–20–19–20–20; 15 with terminal bristle; antennal ratio (11–15/3–10), 1,0. Palpus (Fig. 76) dark in colour, segments 2–5 with relative lengths 12–15–5–11; segment 3 nearly parallel-sided with shallow sensory pit on inner side near apex.

Thorax. Brown with broad dark stripe medially, crossing otherwise pale scutellum; area surrounding humeral pits paler (this pattern varies among unmounted females but is essentially as described); pleuron brown but extensive membranous areas paler; postnotum dark brown. Wing with three well-defined dark patches, one over r-m crossvein, one at tip of second radial cell, and third in center of cell R5; veins well marked; apex with some macrotrichia, microtrichia minute; 2nd radial cell more than 2 × as long as 1st. Legs: Hind leg with femur and tibia dark brown, each with narrow subapical and apical pale bands; hind margin of tibia with row of long, rather strong bristles, apical spur short and pectinate, preapical comb slanted with numerous teeth, apical row of 8 strong dark spines; basitarsus brown, bent at base where it bears a strong black spine, a slightly weaker spine at apex; tarsomeres 2 and 3 paler, each with 2 small spines apically, 4 and 5 slightly darker, unarmed. Fore and mid legs mainly pale with femora narrowly dark at apex and tibiae so basally; no heavy spines on these segments. On all legs 4th tarsomeres cordiform; 5th long and slender; claws, 1 long and 1 much shorter.

Abdomen (Fig. 77). Strikingly yellow dorsally, whitish ventrally where segments 3–7 each bear a pair of longitudinal sclerotized setose stripes; strongly pigmented laterally, especially towards apex. Distal margin of 8th sternum with triangular incision; 9th sternum weakly, and cerci strongly sclerotized. Spermathecae (Fig. 77) 2, strongly sclerotized, each with some hyaline spots and fairly long sclerotized necks; 0,100 × 0,057 mm and 0,070 × 0,052 mm, each with neck 0,018 mm long.

MATERIAL EXAMINED. Holotype ♀, paratype 1 ♀: SOUTH AFRICA: Transvaal, New Agatha, Runge Farm, 16.xi.1981, H. Cross & M. Coetzee, UVL trap. (Holotype SAIMR, paratype USNM). SOUTH AFRICA: Natal, Giants Castle, 14.xi.1963, E. Haeselbarth (1 ♀ not a paratype, SAIMR).

The types were taken in a Cross emergence trap over a small pond of slow-moving fresh water with aquatic vegetation.

Tribe HETEROMYIINI

Genus *CLINOHELEA* Kieffer

Clinohelea insperata De Meillon & Wirth, Figs 78–82

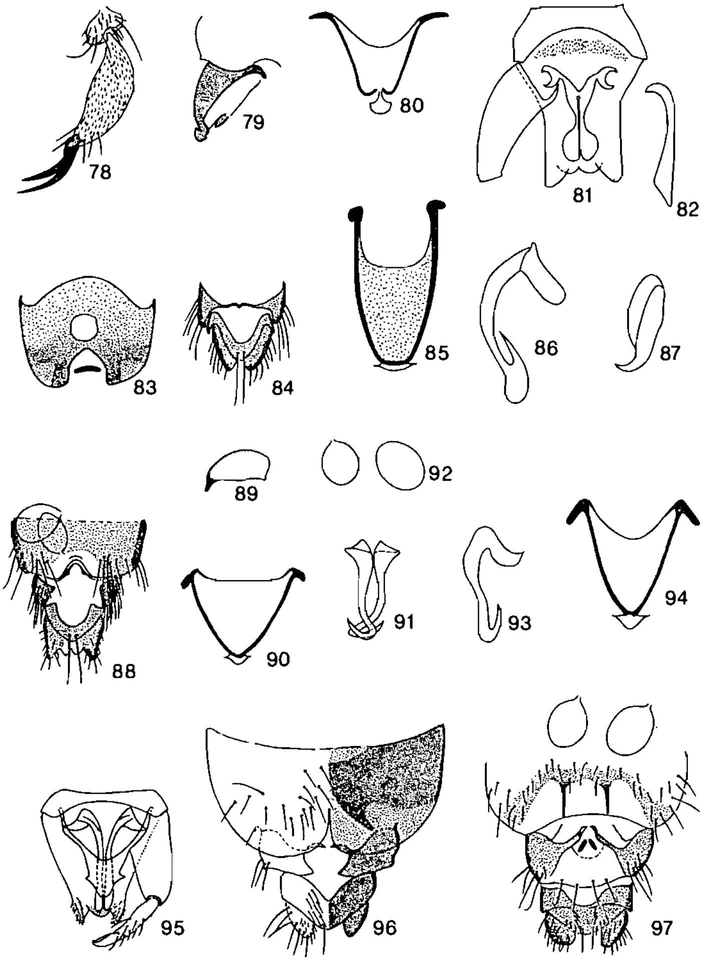
This species was originally described from a female from Richards Bay, Natal. A second specimen was reported from St. Lucia about 120 km north. Since then we have received several males from the type locality and describe them below. The species falls into the ***bimaculata*** group of Grogan & Wirth (1975).

MALE. Wing length 1,32 mm.

Head. Dark brown to black, face, paler; eyes separate by half or more width of head, bare. Antenna with torus black, flagellar segments dark brown; segments 4–11 gradually diminishing in width and increasing in length; 4 slightly longer than wide, 11 about 3 × as long as wide; relative lengths of 9–15 are 8–12–15–15–32–56–47; 15 with terminal bristle; antennal ratio (12–15/3–11), 1,56. Palpus 5-segmented; 2–5 with relative lengths 12–18–15–19; 3rd segment more or less parallel-sided and without sensory pit (in 1 specimen 3 and 4 fused).

Thorax. Uniformly dark brown to black; mesonotum pointed anteriorly where it bears a small tubercle. Wing as in female but costal ratio 0,75. Legs as in female but claws on all legs equal (Fig. 78).

Abdomen. As in female but dorsally without pale median stripe. Genitalia as in Figs 79–82.



Figs 78–82, *Clinohelea insperata* ♂; 83–87, *Mallochohelea fluminea*; 88–91, *M. hamata*; 92–94, *M. unca*; 95–96, *Sphaeromias eugenei*; 97, *Xenohelea galatea:* 78, 4th and 5th tarsomeres and claws; 79, aedeagus, side view; 80, 85, 90, 94, same, ventral view; 81, 9th segment, basistyle and parameres; 82, 87, 89, dististyle; 83, 8th sternum; 84, 9th and 10th sterna and cerci; 86, 93, parameres, side view; 88, 96, 97, genital segments of female; 91, parameres; 92, spermathecae; 95, male genitalia.

New Record. SOUTH AFRICA: Natal, Richards Bay, 22.x.1980, Neethling du Toit, UVL trap, 6 ♂ (BMNH, NM, SAIMR, USNM).

Clastrier (1983) recently described males of two species from West Africa. The male described above is thus the third of the genus from the Subsaharan Region. It resembles that of *C. trimaculata* Clastrier but the wing alone, with two radial cells, immediately separates it from that species.

Tribe SPHAEROMIINI

Genus *MALLOCHOHELEA* Wirth

Mallochohelea fluminea De Meillon & Wirth, Figs 83–87

Hitherto only the female and pupa were known. We recently received a female (genitalia figured in Figs 83–84) from Mr Harold Cross with the male genitalia (Figs 85–87) attached. These resemble those of *M. hansfordi* De Meillon & Wirth very closely. The only apparent distinctions are a slight difference in the shape of the paramere, which is thicker and more robust in *M. fluminea* (Fig. 86); and in the aedeagus, which in *M. hansfordi* is only about as long as the basal width, while in *M. fluminea* (Fig. 85) it is nearly 2 × as long as wide. The females differ greatly in many respects (e.g. the pendulous palpi and unusual development of the long filamentous sensory hair on the 5th tarsomere on the hind leg in *M. hansfordi*). It is possible that when complete males of the two species become known they will be found to have good distinguishing characters.

New Record. SOUTH AFRICA: Transvaal, Tzaneen, Ou Stasie, 5.iii.1982, H. Cross, UVL trap, 1 ♀ with ♂ genitalia attached (USNM). ZIMBABWE: Kariba, xi.1969, D. R. Birkenmeyer, UVL trap, 1 ♀ (USNM).

In the original description of *M. fluminea* the proportions of the last five antennal segments of the female were given as 65–65–60–65–110; the value 110 is an error; in the female from Zimbabwe the proportions are 65–65–65–65–69.

Mallochohelea hamata sp. nov., Figs 88–91

A small dark species.

FEMALE. Wing length 2,5 mm.

Head. Dark brown; eyes separated by width of 1 facet, bare. Mandible with 7 large triangular teeth (Antennae missing). Palpus 5-segmented; 5th segment resembling that of *M. hansfordi* but much shorter, relative lengths of segments 2–5 are 14–16–6–20; 3rd segment parallel-sided and without sensory pit.

Thorax. Dark brown; mesonotum densely covered with small stiff hairs on minute tubercles; some strong bristles on obvious tubercles above wing bases; scutellum dark brown with 8 short strong black bristles on tubercles, and many small hairs, as on mesonotum; postnotum dark brown; pleuron slightly paler; post-spiracular plate with small patch of 7 stiff hairs as on mesonotum. Wing typical of genus; radial veins and costa well marked; 2nd radial cell 3 × as long as 1st; costal ratio 0,80; microtrichia dense, macrotrichia absent. Legs: (both fore legs, 1 mid leg and tarsomeres 3–5 of the other, and tarsomeres 3–5 of 1 hind leg missing) coxae and apical half or more of femora dark brown but no clear banding, all tibiae dark brown; tarsomeres much paler except 4–5 which are infuscated; femora armed with 2–3 and 3–4 short, sharp strong black spines on mid and hind femora respectively; tarsomere 5 of hind leg with 9 batonnets and a long bent apical sensillum, much as in *M. hansfordi* but not so long and sinuous; 2 unequal strong claws, one 2 × length of other, each with a blunt basal external tooth.

Abdomen. Pale brown; terminal segments (Fig. 88) not much darker than others; sternum 8 with moderately deep incision; sternum 9 largely membranous and transparent, but laterally well supplied with setae. Spermathecae (Fig. 88) 2, one nearly spherical, 0,146 × 0,109 mm and other oval, 0,120 × 0,094 mm.

MALE. Genitalia as in Figs 89–91.

MATERIAL EXAMINED. Holotype ♀ with ♂ genitalia attached: MADAGASCAR: Ankara Fantika Forest Reserve, near Marovoay, 1.xii.1959, E. S. Ross (Calif. Acad. Sci., San Francisco).

In spite of the close resemblance of the male genitalia to those of *M. hansfordi*, the female is quite distinct as shown by the greatly enlarged fifth palpal segment, the subequal oval spermathecae, and the great development of the sensory hair on the hind fifth tarsomere of *M. hansfordi*. The unequal hind claws in *M. hamata* are exceptional in the genus, but the character needs confirmation by better material with undamaged legs. The female of *M. hamata* also closely resembles that of *M. fluminea*; differences in the structure of the eighth sternum are, however, obvious (Figs 83, 88). In the male the great width of the aedeagus compared with its length is diagnostic (Fig. 90).

Mallochohelea unca sp. nov., Figs 92–94

A large light brown to yellow species with femoral apices and whole of tarsomere five infuscated; fore femur enlarged.

FEMALE. Wing length 4,18 mm.

Head. Top of head, face, clypeus and mouthparts light brown. Eyes separated by width of 1 facet; bare. Clypeus with long setae. Mandible with 7 large triangular teeth and a few smaller ones. Antenna (only part of 1 antenna present) with segments 4–6 barrel-shaped, paler basally than apically and about 2 × as long as wide in middle; segment 3 2 × as long as 4 and gradually narrowed to base. Palpus elongated, especially segment 3, which is longer than 4+5, parallel-sided, and without a sensory pit.

Thorax. Light brown throughout; mesonotum densely covered with small hairs on tubercles, spine-like setae on larger tubercles above wing bases. Wing veins well marked; 2nd radial cell 3 × as long as 1st; microtrichia dense, macrotrichia absent; costal ratio 0,84. Legs mainly yellowish with apices of femora and 5th tarsomeres infuscated; all femora armed as follows: fore with 18, 22 spines, mid 8, 8, hind 4, 4; fore femur definitely club-shaped, others less so; fore tibia with long, straight, hyaline, apical spur; hind tibial spur small and spine-like, also an apical comb of 10 large but pale spines; hind basitarsus with complete double row of palisade setae and tarsomere 2 with single row of such setae; basitarsus of mid leg with single row, and tarsomere 2 with none; mid tibia with fairly strong apical spine; 5th tarsomeres with batonnets as follows: fore leg 14, mid leg 14, and hind leg 15, 16; hind tarsomere 5 with a curved sensory hair shorter than in *M. hamata*; claws long and equal, each with basal thumb-like spine typical of genus.

Abdomen. Yellowish with apex unsclerotized. Two pigmented, oval spermathecae (Fig. 92), 0,146 × 0,109 mm and 0,120 × 0,094 mm; no sclerotized ducts evident; 9th sternum without patch of bristles such as in *M. hamata*.

MALE. The genitalia (Figs 93–94) attached to the female closely resemble those of *M. hamata* and *M. hansfordi*. Using the genitalia alone it would hardly be possible to separate the males of these three species, whereas the females are readily distinguished. When more specimens become available slight differences in the shapes of the parameres might be found.

MATERIAL EXAMINED. Holotype ♀ with ♂ genitalia attached: KENYA: Archer's Post, Ewaso Nyiro River at 690 m, 6.xii.1969, M. E. Irwin and E. S. Ross (Calif. Acad. Sci., San Francisco).

Genus *NILOBEZZIA* Kieffer

Nilobezzia robusta (De Meillon)

New Record. ZIMBABWE: Kariba, 500 m, 25.xi.1967, D. R. Birkenmeyer, UVL trap (1 ♂, USNM).

Genus *SPHAEROMIAS* Curtis

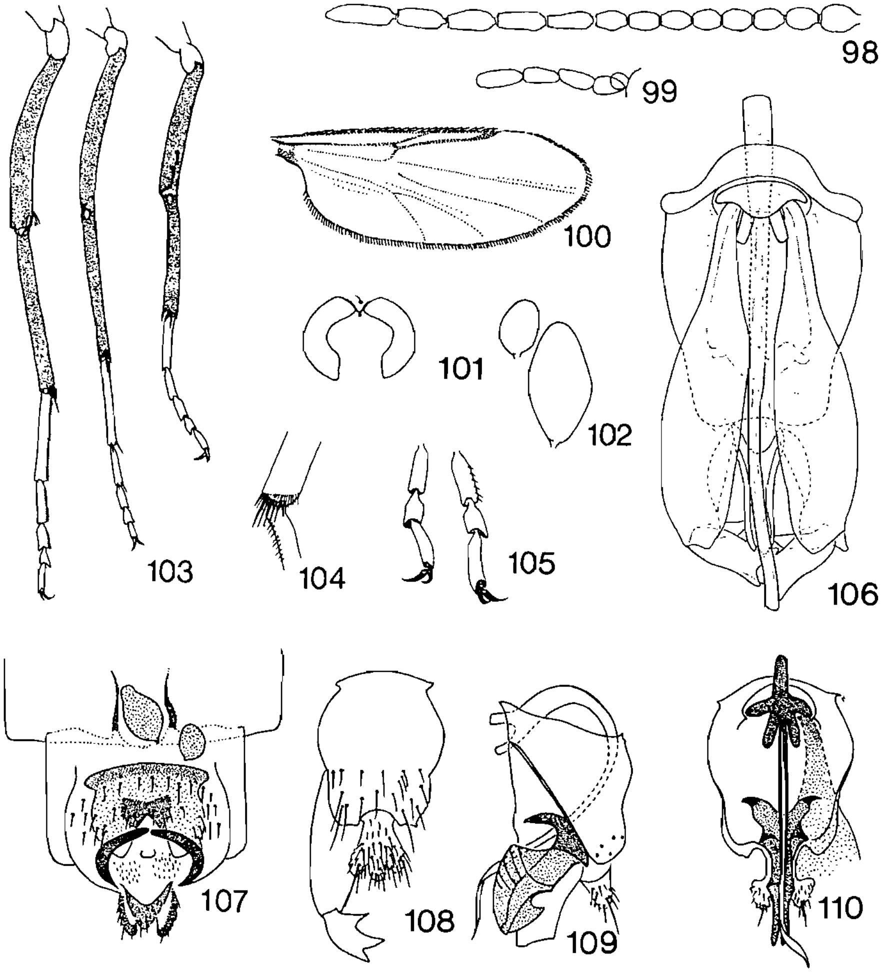
Sphaeromias eugenei sp. nov., Figs 95–96

A large dark species; wing unadorned, femora armed.

MALE. Wing length 2,09 mm.

Head. Dark brown to black; eyes separated by slightly less than width of 2 facets, bare. Antenna mainly brown; segment 3 about 3 × as long as width in middle, 4–10 barrel-shaped and about 2 × as long as wide, relative lengths of 11–15 are 15–23–30–47–57; 15 without terminal bristle; antennal ratio (12–15/3–11), 1,14. Palpus relative lengths of segments 2–5 are 22–27–15–15; 3rd segment nearly parallel-sided and without sensory pit.

Thorax. Dark brown in slide-mounted specimens; mesonotum with many short, scattered hair-like setae and densely covered with small clumps of microtrichia or aculeae (Harbach & Knight 1980); scutellum with large number of slender, fairly long setae which do not appear to be arranged in any order; postnotum slightly darker; pleuron apparently bare but parts densely covered with aculeae not arranged in clumps. Wing unadorned, typical of genus, alula fringed; 2nd radial cell about 2 × as long as 1st; costal ratio 0,79. Legs mainly light brown with apical half of mid and hind femora slightly darker; fore, mid and hind femora armed respectively with 7, 8, 7, 7, 3, 5 short to slightly longer, strong black spines; mid basitarsus with 3–4 black ventral spines and 2 at apex, ventrally with 1 complete row of palisade setae; fore tibia apically with dense patch of spines, short comb of teeth, and a hyaline sinuous apical spur longer than width of tibia; hind tibia with subapical comb and apical row of 8 large dark spines, apical spur small and spinelike; hind basitarsus with double, tarsomere 2 with



Figs 98–110, *Bezzia albicornis*: 98, female antenna; 99, female palpus; 100, female wing; 101, female eye separation; 102, spermathecae; 103, hind, mid, and fore legs (left to right); 104, hind tibial comb; 105, 3rd, 4th and 5th tarsomeres and claws of mid and hind legs of female; 106, male genitalia, ventral view; 107, female genital segments; 108, male genitalia, dorsal view; 109, aedeagus and parameres, side view; 110, detail of aedeagus and parameres, ventral view.

single row of palisade setae, other tarsomeres unarmed; 4th tarsomere short but not cordiform; 5th about as long as 3+4, unmodified; claws small, equal, simple.

Abdomen. Light brown. Genitalia (Fig. 95) with parameres sclerotized, dark brown, rest light brown; 9th sternum narrow, excavated; 9th tergum with well-developed apicolateral processes extending beyond basistyles; basistyle about 2 × as long as basal width, unmodified; dististyle slightly bent and narrowing to apex with curved, beak-like termination; aedeagus V-shaped with large transparent apical cap as illustrated; parameres separate, each a long slender process curved basally and nearly straight distally, with evenly rounded tip.

FEMALE. Wing length 3,42 (range 3,26–3,52 mm, n = 6).

Head. Frons and face very dark brown; eyes narrowly separated by width of 1 facet or less; mandible with 7 large triangular teeth and some smaller ones proximally. Antenna dark brown, segments 4–10 parallel-sided to vasiform, each slightly more than 2 × as long as width at mid-length; segment 3 long, about 2 × length of 4; relative lengths of 11–15 are 18–41–41–41–54; antennal ratio 1,63 (1,55–1,70). Palpus 5-segmented, dark brown, very little variation in lengths of segments, 2 slightly shorter than 3 which about equal to 4 and 5 together, the last 2 sub-equal; 3 nearly parallel-sided without sensory pit.

Thorax. Dark brown throughout; scutellum as in male. Wing with 2nd radial cell more than 3 × as long as 1st, otherwise as in male, costal ratio 0,97 (0,94–0,98). Legs darker than in male, extreme apex and basal half of hind femur brown, rest blackish; mid femur similar, but preapical dark area narrower; fore femur more or less evenly brown; tibiae evenly brown and tarsi slightly paler; femora of fore, mid and hind legs armed respectively with 18 (13–28), 16 (13–18) and 10 (9–11) short, sharp, black spines; tibiae and tarsi as in male except tarsomere 5 which is armed on fore, mid and hind legs respectively with 11 (10–13), 9 (7–11) and 10 (8–10) batonnets; claws shorter than tarsomere 5, equal, each talon with delicate internal barb.

Abdomen. Dark brown. Eighth sternum with narrow, deep, median slit on caudal margin (Fig. 96). Spermathecae 2, pyriform, very dark, with short sclerotized necks; 0,169 (0,156–0,187) × 0,136 (0,130–0,146) mm and 0,141 (0,135–0,156) × 0,113 (0,109–0,122) mm; 3rd spermatheca a short, narrow, sclerotized tube with irregular surface.

MATERIAL EXAMINED. Holotype ♂, allotype ♀: ZIMBABWE, Kariba, xi.1969, D. R. Birkenmeyer, UVL trap (USNM). Paratypes 1 ♂ 9 ♀, same data (1 ♂ 4 ♀ USNM; 2 ♀ BMNH; 2 ♀ NM; 2 ♀ SAIMR).

The species is named for Eugene Marais, poet and pioneer student of animal behaviour in South Africa. Both sexes can be identified by the following key to the Subsaharan species.

Key to Subsaharan species of *Sphaeromias*

1	Females	2
—	Males	8
2	Wing with 1 radial cell	*theileri* De Meillon & Wirth
—	Wing with 2 radial cells	3
3	Wing marked with a distinct dark spot or infuscated in part	4
—	Wing unmarked	7

4 Wing with a dark spot on r-m crossvein 5
— Wing with infuscations basally and apically 6
5 Batonnets on 5th tarsomeres of fore, mid and hind legs, 12–8–8 .... *servilia* De Meillon
— Batonnets on 5th tarsomeres of fore, mid and hind legs, 5–6 on each . *par* (Ingram & Macfie)
6 Mesonotum with anterior tubercle; wing length over 4 mm; femora and tibiae uniformly brown .... *pistiae* (Ingram & Macfie)
— Mesonotum without tubercle; wing length just over 3 mm; femora with light and dark areas, tibiae faintly banded .... *meeseri* De Meillon
7 Femora unarmed .... *litoraureus* Ingram & Macfie
— Femora armed with many short black spines .... *eugenei* sp. nov.
8 Parameres fused apically .... *litoraureus* Ingram & Macfie
corsoni (Ingram & Macfie)
— Parameres separate 9
9. Parameres markedly swollen apically .... *pistiae* (Ingram & Macfie)
— Parameres more or less parallel-sided throughout .... *eugenei* sp. nov.

Genus *XENOHELEA* Kieffer

Xenohelea galatea De Meillon, Fig. 97

New Record. SOUTH AFRICA: Transvaal, Gazankulu, Soutini, 9.xi.1981, H. & J. Cross, UVL trap 1 ♀ (USNM).

The species was originally described from a female bred from a pupa collected in a small clear stream at Nametil, Mozambique in January 1940. The present specimen, of which the apex of the abdomen is illustrated (Fig. 97), agrees with *X. galatea* in all respects but is slightly darker, especially on the femora.

Tribe PALPOMYIINI

Genus *BEZZIA* Kieffer

Bezzia (Pygobezzia) albicornis (Meigen), Figs 98–100

Ceratopogon albicornis Meigen, 1818: 74 (♂; Europe)

Bezzia albicornis (Meigen); Goetghebuer, 1922: 54 (combination; type redescribed; Fig. genitalia); Kieffer, 1925: 122 (in key; distribution); Goetghebuer, 1929: 234 (in key); Goetghebuer, in Goetghebuer & Lenz, 1934: 76 (in key; diagnosis; distribution); Szadziewski, 1984: 184 (syn: *pallidetarsatus*)

Ceratopogon pallidetarsatus Strobl, 1900: 171 (♀; Spain).

Bezzia strobli Kieffer, 1919: 122 (♂ ♀; Hungary); *Syn. nov.* Goetghebuer, in Goetghebuer & Lenz, 1934: 82 (notes; distribution); Zilahi-Sebess, 1940: 107 (redescribed; Fig. ♂ genitalia; syn. *brevinervis*).

Bezzia (Pygobezzia) strobli Kieffer; Remm, 1974: 442 (in key; notes; Figs; type species of *Pygobezzia* **subg. n.**; syn.: *atrata, brevinervis*).

Bezzia brevinervis Kieffer, 1919: 122 (♂ ♀; Hungary). **Syn. nov.**

Homobezzia atrata Macfie, 1944: 126 (♂ ♀; Egypt; Fig. ♂ genitalia) **Syn. nov.**

Bezzia atrata (Macfie), Clastrier, 1962: 112 (redescribed; Algeria; Fig. ♂ genitalia).

Wing length 1,3–1,4 mm. Shining black species with femora and tibiae blackish, tarsi whitish to pale brown, 5th tarsomeres somewhat infuscated; wing pale, halter brownish.

Head. Eyes (Fig. 101) separated. Antenna (Fig. 98) short, brownish, segments 3–10 with pale bases. Palpus (Fig. 99) pale, slender.

Thorax. Mesonotum with abundant short bristly hairs. Legs (Fig. 103) with 2 stout ventral spines on fore femur; hind tibia with 6–8 dorsal bristles; tibial comb as in Fig. 104; 4th tarsomeres (Fig. 105) subcylindrical, 5th unarmed, claws short, each with small inner tooth. Wing (Fig. 100) with radial cell short, costal ratio about 0,6.

Abdomen. Dark brown. Female (Fig. 107) with 1 pair of long gland rods, located on 7th tergum. Spermathecae (Fig. 102) 2, irregularly oval with short slender neck; unequal, 0,103 × 0,055 mm and 0,052 × 0,031 mm. Male genitalia (Figs 106, 108–110) elongate and greatly modified from type usual in genus; basistyle (Fig. 106) extremely long and slender; dististyle (Figs 106, 108) short with 3 pointed teeth or processes; aedeagus (Figs 106, 109) a slender, ribbon-like structure arising near 9th sternum, looping proximad and dorsad, then continuing caudad and more ventrad to pass through a slender channel in parameres (Figs 109–110) and between basistyles to protrude caudad past apices of dististyles in a slender black rod.

Distribution. Widespread in Europe; in Africa recorded from Algeria, Egypt in North Africa; in Asia east to Okinawa and northern Thailand.

New Record. SOUTH AFRICA: Transvaal, Gazankulu, Soutini, 9.xi.1981, J. & H. Cross, UVL trap 4 ♂ 2 ♀ (BMNH, NM, SAIMR, USNM).

One of us (WWW) examined the male holotype of *Ceratopogon albicornis* Meigen in the Paris Museum in 1973 and confirmed its identity as redescribed by Goetghebuer (1922). We have no hesitation in placing *B. strobli*, *B. brevinervis* and *B. atrata* as junior synonyms. Remm (1974) made no mention of *B. albicornis* in his excellent review of the *Bezzia* species of the USSR in which he placed *B. brevinervis* and *B. atrata* in synonymy with *B. strobli*. Three other Palaearctic species, *B. fuliginata* Clastrier, *B. nigrita* Clastrier and *B. sajana* Remm, are closely related and, together with *B. albicornis*, comprise the distinct subgenus *Pygobezzia* Remm.

Bezzia (Bezzia) haroldi sp. nov., Figs 111–113, 115

A medium sized brown to dark brown species without any striking ornamentation. Named for the collector.

MALE. Wing length 1,43 mm.

Head. Dark brown above, face and clypeus paler; eyes widely separated by width of 6 facets, bare. Antenna with torus and segments 3–4 dark brown, 5–12 gradually narrowing and lengthening, each with distal half darker; 13–15 all dark; relative lengths of 11–15 are 16–27–10–10–11; antennal ratio (12–15/3–11), 0,58. Palpus pale; 3rd segment narrow, of about even width throughout, without sensory pit; relative lengths of 2–5 are 12–20–13–17.

Thorax. Mesonotum and postnotum dark brown, scutellum pale yellow with 4 long pale bristles and a few small hairs, mesonotum with small setae only, except above wing bases where 3 long pale bristles on each side; pleuron darker anteriorly with a few small setae on sub-spiracular plate. Wing unmarked, veins well delineated; costal ratio 0,65; macrotrichia absent, microtrichia dense; alula bare; media barely sessile. Legs brown with apices of femora; apices and bases of tibiae darker, faint indications of broad median dark bands on fore and hind tibiae; tarsi pale but tarsomeres 4 and 5 slightly darker; fore femur armed with 2 strong long black spines; fore tibia with short apical comb and a long straight apical spur; hind tibia with short comb of teeth as on fore tibia, an apical row of 6–7 long spines and a short apical spine-like spur; mid tibia with long black spine apically; hind basitarsus with double row of palisade setae, 2nd with single such row and 3rd without any; mid and fore tarsi without modified hairs; claws small, simple and nearly straight.

Abdomen. Pale brown with genitalia darker. Ninth sternum and basal part of tergum large and sclerotized, apical part of tergum quite small, reaching just a little past midlength of basistyle; apicolateral processes feebly developed. Basistyle (Fig. 111) short and broad, only slightly longer than broad at its widest; dististyle (Fig. 112) short, broad basally, slightly curved to a point. Aedeagus (Fig. 111) with strong, broad, sclerotized basal arch and narrow unpigmented distal process reaching to apex of basistyle. Parameres (Fig. 113) fused, in ventral view proximal 2/3 wider and more heavily sclerotized than distal 1/3; the side view (Fig. 115) will help to clarify the relationship between paramere and aedeagus.

Material examined. Holotype ♂: SOUTH AFRICA: Transvaal, Arabie, Olifants River, 20.ix.1982, Harold Cross, UVL trap (SAIMR).

The genitalia, though somewhat resembling those of the *africana* group of species, are unique and distinctive.

Bezzia (Bezzia) insolita De Meillon & Wirth, Figs 116–118

One male and three females collected at Tzaneen enable us to supply additional information. The male antenna, which was missing from previous specimens, is black throughout and peculiar in that the last five segments are elongated as in the female, 9–15 with relative lengths 20–27–40–61–36–43–47; antennal ratio 0,85; verticils present on segments 3–12. A further peculiar feature is that in both sexes the media is not sessile but petiolate as in Fig. 116 (copied from a phase contrast microphoto made by Maureen Coetzee at the Department of Zoology, University of the Witwatersrand, Johannesburg).

Female. In the original description it was stated that the unusually developed male genitalia did not seem to have a counterpart in the female. The present specimens do, however, show a strong, black furrowed sclerite in the region of the gonopore (Figs 117–118). This structure may act as a guide for the greatly developed aedeagus of the male. Apart from this the females agree with the previous description.

New Record. SOUTH AFRICA: Transvaal, 'Die Tuine', Tzaneen, xii.1982, Maureen Coetzee, UVL trap 1 ♂ 3 ♀ (BMNH, NM, SAIMR, USNM).

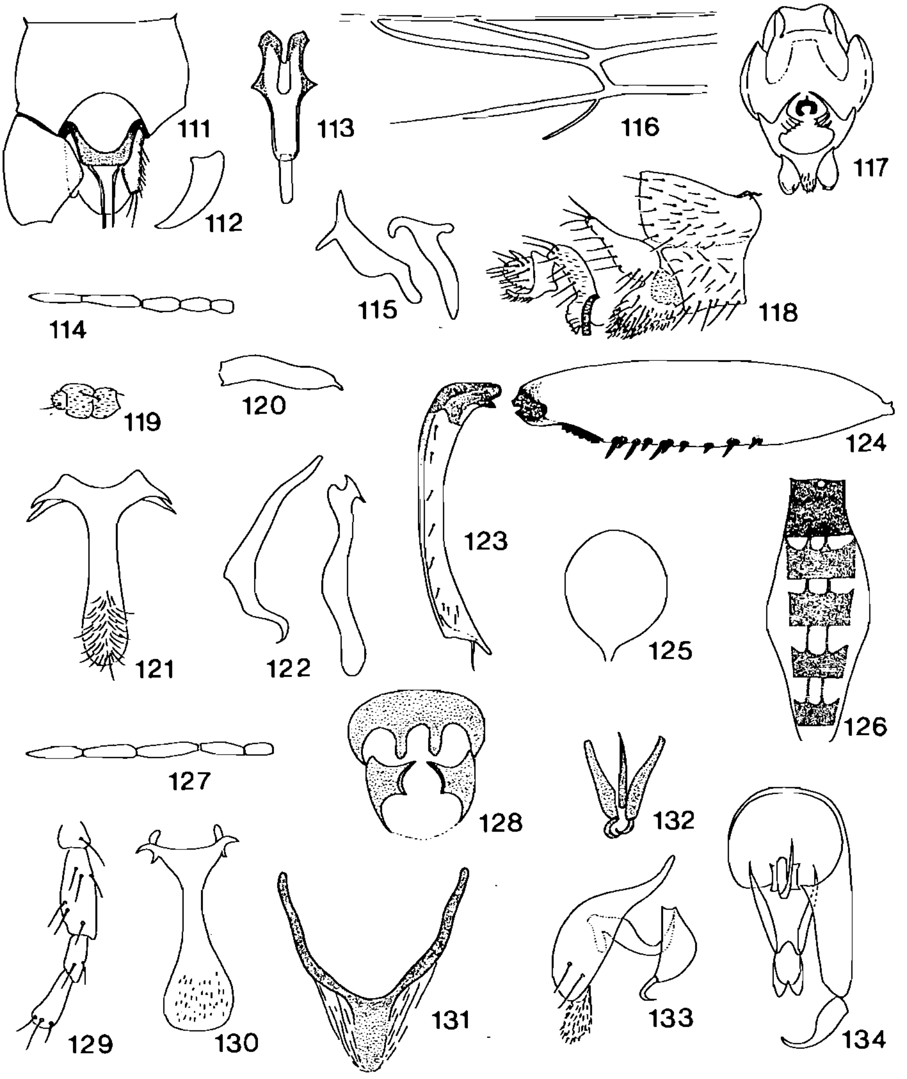
Genus *PALPOMYIA* Meigen

Palpomyia gilva sp. nov., Figs 123–126

A mainly yellow species with head, antenna and postnotum dark brown to black; extreme apices of femora and tibiae infuscated; fore femur strongly swollen with about 19 short stout blunt black spines, other femora unarmed. Wing unornamented.

Female. Wing length 2,2 mm.

Head. Dark brown dorsally, clypeus paler; eyes separated by width of 5 facets, bare. Antenna dark brown throughout; segment 3 nearly 4 × as long as wide, not swollen; segments 4–10 slightly swollen in midportion, each about 2 × as long as



Figs 111–113, 115, *Bezzia haroldi* ♂; 114, 119, 121, *Palpomyia fusca* ♂; 116–118, *Bezzia insolita*; 120, 122, 127, 129–131, *Palpomyia kuruwana*; 123–126, *P. gilva*; 128, 132–134, *P. verna*: 111, 9th segment, basistyle and aedeagus; 112, 120, dististyle; 113, 131, aedeagus; 114, 127, antennal segments 11–15; 115, 122, aedeagus and parameres, side view; 116, radial field of wing; 117, 128, female genital segments, ventral view; 118, apex female abdomen side view; 119, 129, palpus; 121, 130, parameres; 123, fore tibia; 124, fore femur; 125, spermatheca; 126, sclerotization of gland rods of female abdomen; 132, aedeagus and parameres, ventral view; 133, 9th segment, aedeagus, and parameres, side view; 134, 9th segment, basistyle, dististyle, and parameres.

widest; sensilla trichodea on 3–10 very long, reaching to apex of following segment; relative lengths of segments 10–15 are 24–55–58–69–70–88; segment 15 with subterminal seta; antennal ratio (11–15/3–10), 1,76. Palpus yellowish like clypeus except segment 5 slightly darker; all segments more or less parallel-sided; 3rd without sensory pit; relative lengths of 3–5 are 61–17–20.

Thorax. Mesonotum, pleuron and scutellum yellowish, latter with 4 short strong straight bristles; postnotum black; mesonotum with strong anterior tubercle and short delicate setae; 4 short strong black spines above wing base; subspiracular plate with setae as on mesonotum. Wing with microtrichia dense giving wing slightly dusky appearance, no macrotrichia; anterior veins well marked, 2nd radial cell about 2 × as long as 1st; costal ratio 0,79. Legs mainly yellowish, apices of femora and bases of tibiae infuscated; apices of tibiae of fore and mid legs slightly darkened, darkening on legs rather diffuse and not clearly defined as bands. Fore tibia strongly arcuate (Fig. 123); fore femur (Fig. 124) expanded, with about 19 short blunt stout black spines on ventral surface; hind tibia with short apical spur and row of 6 pale spines; hind basitarsus with double row of palisade setae, hind tarsomere 2 and basitarsus of mid leg each with single row of such setae; mid tibia with short black spine apically; basitarsus and tarsomere 2 of mid leg apically with pair of short black spines; tarsomeres 4 and 5 on all legs slightly darker; all claws short, equal, each talon with a short but stout tooth on inner side.

Abdomen. First and 2nd tergum dark brown; terga 3–7 with dark brown bands separated from one another by bands of whitish integument across which 5 pairs of gland rods are very conspicuous (Fig. 126). Spermathecae (Fig. 125) 2, pyriform, approximately equal (one well displayed 0,068 × 0,044 mm, including short slender neck).

Material examined. Holotype ♀: SOUTH AFRICA: Transvaal, Tzaneen, 'Ou Stasie', 25.iii.1982, J. Cross, UVL trap (SAIMR).

This species belongs to a group in the Subsaharan region in which only the fore femur is armed. These species may be identified by the key following the description of the next two species.

One female from Zimbabwe, St Ignatius, iii.1971, Fr. Watsham (USNM) resembles *P. gilva* closely but differs in being much larger. Since the wing is not well displayed we compared lengths of the femora on the fore, mid and hind legs; in *P. gilva* they were 32, 42, 47 units compared to 40, 54, 63 in the Zimbabwe female. In the latter the 5th tarsomeres carried from 1–5 sharp spines reminiscent of those seen in *Phaenobezzia*, whereas in the type of *P. gilva* these are scarcely enlarged. Otherwise the two specimens resemble one another in all respects.

Palpomyia kurwana sp. nov., Figs 120, 122, 127, 129–131

A medium sized, dark brown species without any striking ornamentation.

Male. Wing length 1,87 mm.

Head. Dark brown above, face and mouthparts paler; eyes separated by width of 4–5 facets, bare. Antenna (Fig. 127) light brown, segments 4–10 slightly barrel-shaped; relative lengths of segments 10–15 are 10–13–16–22–23–23; 15 without strong apical seta; antennal ratio (12–15/3–11), 0,80. Palpus (Fig. 129) normal, 5-segmented; 3rd segment expanded, no sensory pit.

Thorax. Dark brown throughout; scutellum slightly paler, with row of 12 moderately long setae. Wing unornamented, 1st radial cell 0,8 × as long as 2nd; costal ratio 0,75; macrotrichia absent, microtrichia minute and dense. Legs with coxae, femora and tibiae uniformly dark brown; tarsomeres 1–4 of all legs pale brown, 5 slightly darker; fore, mid and hind femora armed with 3, 4; 1, 2; 2, 4 short black spines respectively; fore tibia apically with short curved comb of 5 teeth and large straight hyaline spine-like spur about as long as width of tibia; hind tibia with apical row of 8 long pale spines and small spine-like apical spur; mid tibia with short black spine apically; hind basitarsus with double row of palisade setae and small lightly coloured apical spine, hind tarsomere 2 with single row of such setae; mid basitarsus with single row of palisade setae and 1–2 short apical spines, mid tarsomere 2 with single, short, sharp spine apically; 4th tarsomeres cylindrical, 5th armed on hind leg with pair of short, sharp spines on basal half.

Abdomen. Brown to dark brown throughout. Genitalia (Figs 120, 122, 130–131) with 9th sternum narrow with large spiculate membrane to aedeagus; tergum slightly narrowed to apex, reaching well beyond basistyles, without discrete apico-lateral processes; basistyle slightly wider basally and slightly more than 3 × as long as wide; dististyle (Fig. 120) slightly bent near base, parallel-sided to apex where it narrows acutely to end in a short beak-like formation; aedeagus (Fig. 131) Y-shaped with high, wide arch; parameres (Fig. 130) fused, markedly expanded distally with a few minute setullae on ventral surface.

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: Cape Province, Kuruman, 3.xi.1980, B. De Meillon & G. van Eeden, UVL trap (SAIMR).

The place name Kuruman is said to have been derived from 'kurwana', meaning a gourd, hence the name of the species.

This species closely resembles *P. fusca* De Meillon (Figs 114, 119, 121); the apically expanded fused parameres and fully developed palpus of *P. kurwana* immediately separate the two. The genitalia with their apically expanded, fused parameres are indistinguishable from those of *Homohelea delanoe* (De Meillon) (originally described as a *Palpomyia*). The present species differs in the shape of the apex of the aedeagus, in the relative lengths of antennal segments 13–15 which are subequal, whereas 14 is longer than 13 or 15 in *H. delanoe*, and the antennal ratios 0,80 and 0,95 respectively. The wing at 1,87 mm is slightly longer than that of *H. delanoe* (1,25 mm) and the first radial cell of *P. kurwana* is 0,8 × the length of the second, whereas it is 0,6 × in *H. delanoe*. The dististyles in the 3 species *P. fusca, H. delanoe* and *P. kurwana* are identical in shape.

Palpomyia verna sp. nov., Figs 128, 132–134

A dark brown to brownish species without any obvious markings; only the fore femur armed but it is not swollen; genitalia distinctive.

MALE. Wing length 1,54 mm.

Head. Dark brown; eyes separated by width of 2–3 facets, bare. (Antennae missing). Palpus 5-segmented; relative lengths of 2–5 are 13–21–14–15; segment 3 more or less parallel-sided, without sensory pit.

Thorax. Dark brown including pleuron, postnotum and scutellum, latter with

5 strong bristles and some fine hairs; subspiracular sclerite with 5 rather long setae and many small fine hairs; mesonotum with rather short stiff setae and 3 strong black spines on each side above wing base, anteriorly with small but definite tubercle. Wing plain, with dense microtrichia and no macrotrichia; 2nd radial cell 3 × as long as 1st; costal ratio 0,71. Legs with femur and tibia of hind leg dark brown, rest of hind leg and all of fore and mid legs brown to light brown, extreme base of hind femur paler; fore femur armed with 4–5 widely and evenly spaced short stout black spines, other femora unarmed; hind basitarsus and tarsomere 2 each with double row of palisade setae; mid basitarsus with single row of such setae; 4th tarsomeres cordiform; all claws small, slightly curved and equal.

Abdomen. Slightly paler than thorax except extreme apex which is dark brown. Ninth sternum a narrow band; tergum sclerotized and strong, bearing apically a pair of large, pad-like lobes; basistyle long and narrow, projecting well beyond tergum; dististyle rather short. Aedeagus (Figs 132–133) of 2 triangular plates when seen in ventral view, each with a hook-like appendage apically (Fig. 133). Parameres (Figs 132–134) black; completely fused and drawn out to a long sharp point which is strongly curved; viewed ventrally, curved portion of parameres lying between 2 plates of aedeagus (Fig. 132) peculiar position of parameres evident only in side view (Fig. 133).

FEMALE. Though the male holotype was alone in the catch of 3.ix.1980, a catch made at the same place on 7.x.1980 yielded what we believe to be the female of the species. In general appearance it matches the male in most respects and only differences are noted below.

Wing length 2,13 mm.

Head. Mandible with 8 narrow, sharp teeth. Relative lengths of antennal segments 10–15 are 10–37–34–38–39–48; antennal ratio (11–15/3–10), 2,50.

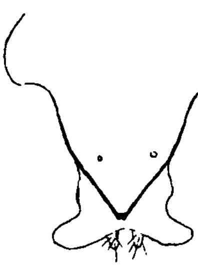
Thorax. Wing with the 2 radial cells, especially 1st, better developed than in male, 2nd 2 × as long as 1st; costal ratio 0,79. Legs with hind femur and tibia paler than in male and not darker than other legs.

Abdomen. With 1 pair of gland rods. Genital sclerotization as in Fig. 128. Two spermathecae, subequal, well pigmented, each with narrow short sclerotized neck; subglobular; each measuring 0,094 × 0,073 mm.

MATERIAL EXAMINED. Holotype ♂: SOUTH AFRICA: Transvaal, Tzaneen, 3.ix.1980, J. Cross, UVL trap (SAIMR). Paratype same locality, in 'Cross' emergence trap, 8.x.1982, 1 ♂ (USNM); same data but in UVL trap, 7.x.1980, 1 ♀ (not paratype) (USNM).

This species and *P. gilva* belong to a group in which the femur of only the fore leg is armed. The Subsaharan species of the group can be distinguished by the following key:

1	Wing with dark median patch	*kilembei* Macfie
—	Wing unornamented	2
2	Fore femur greatly enlarged	3
—	Fore femur normal or only slightly enlarged	6
3	Thorax and legs almost entirely lemon yellow; fore femur with 19 short black spines; fore tibia strongly arcuate	*gilva* sp. nov.
—	Thorax blackish; fore femur with fewer than 14 spines; fore tibia normal	4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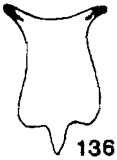
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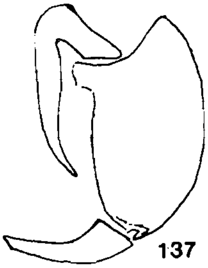
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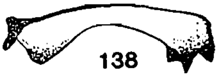
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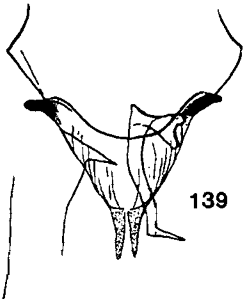
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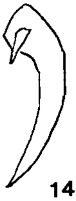
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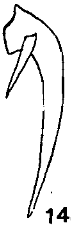
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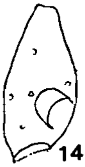
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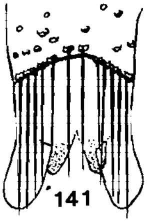
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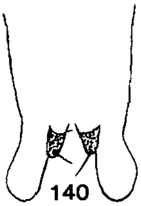
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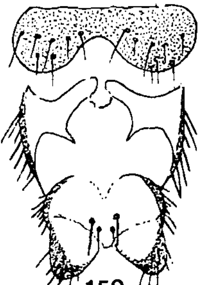
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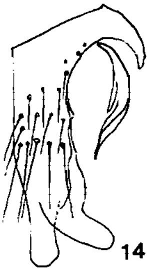
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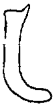
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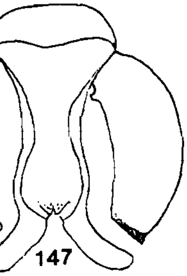
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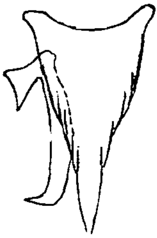
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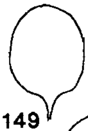
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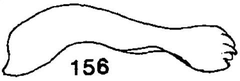
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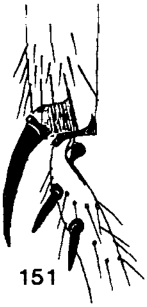
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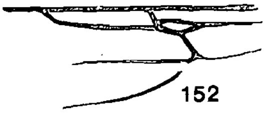
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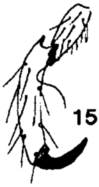
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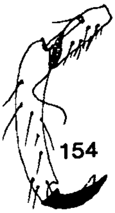
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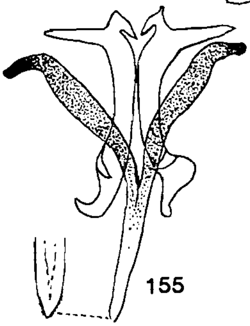
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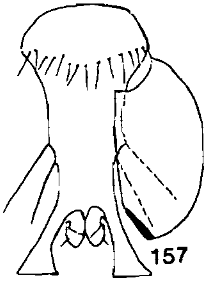
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4 Halter pale .... *ruficrus* Goetghebuer
— Halter with infuscated knob 5
5 Legs yellow, knee of fore leg and apices of all tibiae dark .... *brevipes* Goetghebuer
— Hind femur dark at apex, hind tibiae dark at base and apex .... *thomsoni* Macfie
6 Hind femur with dark apical band 7
— Hind femur without definite demarcated band 8
7 Dark band on distal fourth of hind femur; thorax dark brown .... *portali* Macfie
— Dark band at tip of femur only; thorax blackish .... *johnstoni* Macfie
8 Fore femur with 4 widely spaced, small black spines (♂) .... *verna* sp. nov.
— Fore femur with 13 small black spines (♀) .... *elgoni* Macfie

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REFERENCES

CLASTRIER, J. 1962. Notes sur les Cératopogonidés. XVI. Espèces du genre *Bezzia* Kieffer ou apparantées de la Région Paléarctique. *Archives de l'Institut Pasteur d'Algérie* **40:** 53–125.

———— 1983. Description de deux nouvelles espèces Afrotropicales concernant les genres *Ceratobezzia* et *Clinohelea* (Diptera, Ceratopogonidae). *Revue Française d'Entomologie* (n.s.) **5:** 19–26.

DE MEILLON, B. 1959. Diptera (Nematocera): Ceratopogonidae. *South African Animal Life:* Results of the Lund University Expedition 1950–1951. *Stockholm: Swedish Natural Science Research Council* **6:** 325–355.

DE MEILLON, B. & WIRTH, W. W. 1981a. Subsaharan Ceratopogonidae (Diptera). V. *Kolenohelea*, a new genus of African Stilobezziini. *Annals of the Natal Museum* **24:** 513–523.

———— 1981b. Subsaharan Ceratopogonidae (Diptera). VI. New species and records of South African biting midges collected by A. L. Dyce. *Annals of the Natal Museum* **24:** 525–561.

Figs 135–137, *Fanthamia abditus* ♂; 138–141, *Kolenohelea leonina* ♂; 142–150, *K. pedi*; 151–157, *K. pugilator* ♂: 135, 9th tergum, dorsal view, 136, aedeagus; 137, basistyle, dististyle, paramere; 138, 146, 156, dististyle; 139, 148, 155, aedeagus and paramere(s), ventral view; 140, lobes of 9th tergum, ventral view; 141, same, dorsal view; 142, 3rd palpal segment; 143, claws of fore leg of female; 144, same, hind leg; 145, 9th segment and aedeagus, side view; 147, 157, 9th segment and basistyle; 149, spermatheca; 150, female genital segments; 151, apex of fore tibia and base of basitarsus; 152, radial field of wing; 153, 4th and 5th tarsomeres and claws of mid leg; 154, same, hind leg.

——————— 1983. Subsaharan Ceratopogonidae (Diptera). XI. The genus *Serromyia* Meigen. *Annals of the Natal Museum* **25:** 383–402.

DOWNES, J. A. & WIRTH, W. W. 1981. Chapter 28. Ceratopogonidae, p. 393–421. In: *Manual of Nearactic Diptera.* McAlpine, J. F. et al. (eds.) Vol. 1. 674p. Research Branch, Agriculture Canada Monograph, 27.

GOETGHEBUER, M. 1922. Nouveaux matériaux pour l'étude de la faune des Chironomides de Belgique. *Annales de Biologie Lacustre* **11:** 38–62.

——————— 1929. Deux formes nouvelles de Ceratopogonidae de Belgique. *Bulletin et Annales de la Société Royale Entomologique de Belgique* **68:** 232–234.

GOETGHEBUER, M. & LENZ, F. 1933–34. 13a. Heleidae (Ceratopogonidae). In: *Die Fliegen der palaearktischen Region.* Lindner, E. (ed.) Stuttgart: E. Schweizerbart'sche Verlagsbuchhandlung 3(2). pp. 1–48, pls. 1–6 (Lfg. 77, 1933); pp. 49–133, pls. 7–12 (Lfg. 78, 1934).

GROGAN, W. L., Jr. & WIRTH, W. W. 1975. A revision of the Nearctic species of *Clinohelea* Kieffer (Diptera: Ceratopogonidae). *Great Basin Naturalist* **35:** 275–287.

HARBACH, R. E. & KNIGHT, K. E. 1980. *Taxonomist's glossary of mosquito anatomy.* Marlton, N. J. Plexus.

KIEFFER, J. J. 1919. Chironomides d'Europe conservés au Musée National Hongrois de Budapest. *Annales Historico-naturales Musei Nationalis Hungarici* **17:** 1–160.

——————— 1925. Diptères (Nématocères piqueurs): Chironomidae Ceratopogoninae. *Faune de France* **11:** 1–139.

MACFIE, J. W. S. 1944. A new species of *Homobezzia* (Diptera, Ceratopogonidae) from Egypt. *Proceedings of the Royal Entomological Society of London.* (B) **13:** 125–126.

MEIGEN, J. W. S. 1818. Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. *Aachen: Forstmann* **1:** 1–332.

REMM, H. 1974. A review of species of the genus *Bezzia* Kieffer (Diptera, Ceratopogonidae) from the fauna of the USSR. I. *Entomologicheskoe Obozrenie* **53:** 429–442. (In Russian, English summary).

STROBL, G. 1900. Spanische Dipteren. XI. *Wiener Entomologische Zeitung* **19:** 169–174.

SZADZIEWSKI, R. 1984. Redescriptions of three species of the biting midges (Diptera, Ceratopogonidae) described by Becker from Egypt. *Polskie Pismo Entomologiczne* **54:** 183–194.

WIRTH, W. W. 1952. The Heleidae of California. *University of California Publications in Entomology* **9:** 95–266.

WIRTH, W. W. & MARSTON, N. 1968. A method for mounting small insects on microscope slides in Canada balsam. *Annals of the Entomological Society of America* **61:** 783–784.

WIRTH, W. W., DE MEILLON, B. & HAESELBARTH, E. 1980. Family Ceratopogonidae. In: *Catalogue of the Diptera of the Afrotropical region.* Crosskey, R. W. (ed.), London: British Museum (Natural History) pp. 150–175.

WIRTH, W. W., RATANAWORABHAN, N. C. & BLANTON, F. S. 1974. Synopsis of the genera of the Ceratopogonidae (Diptera). *Annales de Parasitologie Humaine et Comparée* **49:** 595–613.

WIRTH, W. W., RATANAWORABHAN, N. C. & MESSERSMITH, D. H. 1977. Natural history of Plummers Island, Maryland. XXII. Biting midges (Diptera: Ceratopogonidae). 1. Introduction and key to genera. *Proceedings of the Biological Society of Washington* **90:** 615–647.

ZILAHI-SEBESS, G. 1940. Magyarorszag Heleidae. *Folia Entomologica Hungarica* **3:** 10–133.

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